The AUTOMOBILE

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Marks the Wonderful Supremacy of the

HUDSON SUPER SIX TRADE NAME REG.

$1375 at Detroit

Patented by Hudson December 28, 1915 Patent No. 1165861

Hudson Super-Six

Eights and Twelves Defeated by a Six

THE facts about the Super-Six seem almost like fiction.

Think of increasing motor efficiency 80 per cent at one jump without adding size or cylinders.

Think of a small, light Six—cylinders 3½ x 5—developing 76 horsepower.

Think of that Six, in official tests, breaking all stock-car records.

Think of a simple, light-weight Six outmatching Eights and Twelves.

And think of a $1375 car proving itself, beyond possible question, the best performing car of the day.

MEN WILL HAVE THAT 80%

This motor's capacity is 288 cubic inches. The best former motors in that size delivered about 42 horsepower. The Super-Six delivers 76 horsepower.

Any motor which shows about half that efficiency will have no attraction now.

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So it means vast economy. It means such smoothness as you never have known before. It means matchless flexibility. It means, as shown by official tests, record quick response.

Every quality men prize in a motor has been bettered vastly in this Super-Six.

EXCLUSIVELY HUDSON

Now, for the first time, a premier attraction is found in one car only.

The Super-Six is a Hudson invention controlled by Hudson patents. So no other car will have it. And any like performance is impossible without it.

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So this invention gives the palm to Hudson, over all cars in the field. One ride in the Super-Six will convince you of that.

$42,000,000 OUTPUT

We have doubled our factory because of this invention. And we shall build this season $42,000,000 worth of these Super-Sixes.

They come equipped with most luxurious bodies. All that we save by this doubled production has gone into extra elegance.

So the Super-Six will stand supreme both in motor and in looks. Any Hudson dealer stands ready to prove that to your fullest satisfaction.

7-Passenger Phaeton, $1375 at Detroit.

Five Other Body Styles.

Super-Six Catalog Is Ready.

HUDSON MOTOR CAR COMPANY, DETROIT

World's Records Broken

All Records up to 100 Miles

Made at Sheepshead Bay under supervision of American Automobile Association, with a 7-passenger stock-car Super-Six. Breaking all stock-car records for any size, or any price, or any number of cylinders.

100 miles in 80 min., 21.4 sec., averaging ***74.67 miles per hour***, with driver and passenger.

Previous best stock-car record was made with a multi-cylinder car carrying driver only.

75.69 miles in one hour with driver and passenger.

Two laps made at 76.75 miles per hour.

Standing start to 50 miles per hour in 16.2 sec. A new record in quick acceleration.

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(Means uncertainty of success)

Experience

(Means certainty of success)

TWO letters are all the difference in the *LOOKS* of these two words, but "*experiment*" means *uncertainty* and "*experience*" means *certainty*, based on expert knowledge, when applied to speedometer construction.

Long ago we discarded the uncertain centrifugal principle of speedometer construction, as our experience, and that of 95% of all car makers, proved that the MAGNETIC PRINCIPLE is the only correct one for speedometers.

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Every car owner wants the Stewart, which is the product of all that experience dictates to give lasting service with absolute accuracy under all conditions. FORD Owners must buy their speedometers from dealers now. They demand the Stewart. Why take chances at all?

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VOL. XXXIV NEW YORK—THURSDAY, JANUARY 13, 1916—CHICAGO No. 2

The AUTOMOBILE

Truck Industry Triumphant

Foreign and Domestic Demands Eclipse All Records—Better Trucks, Better Finance and Better Prospects Rule for 1916

By A. Ludlow Clayden

ABSORBED as we have been in the spectacle of prosperity presented by the passenger-car industry, we may, perhaps, have overlooked that of the sister industry caring for the demands of users of commercial vehicles. Yet never before has there been such a year of advancement in the truck field, never before have prospects for the future looked so bright throughout the world.

There is a tendency to look upon American truck-building prosperity as a thing fostered by war and sure to wane as peace once more resumes its sway over the civilized world. But, though fostered by war, without doubt there is no more reason for anticipating a slump with peace than there is reason to assume that the roses will wither directly the manure around the roots of the tree is absorbed. Growing slowly from year to year the commercial motor vehicle needed a stimulus to jump it from its adolescence to its manhood, and war has supplied that need. Once man's estate is reached and realized, however, one can never be a child again, and so with the motor truck industry—it can never again lose the place it now occupies, but will go on to work out its great destiny.

War has supplied three things: It has supplied money, money to buy trucks and so keep running the premier factories throughout the world on war supplies. It has supplied money that is being applied to the betterment of those premier companies—money which will see them in a better state at the end of their war orders than they were before the war orders began.

It has supplied advertising, the greatest advertising any industry ever had. To open an illustrated paper in America, France, England, Italy or Germany, without seeing a picture of motor trucks at work is almost an impossibility and has so been for nearly two years past.

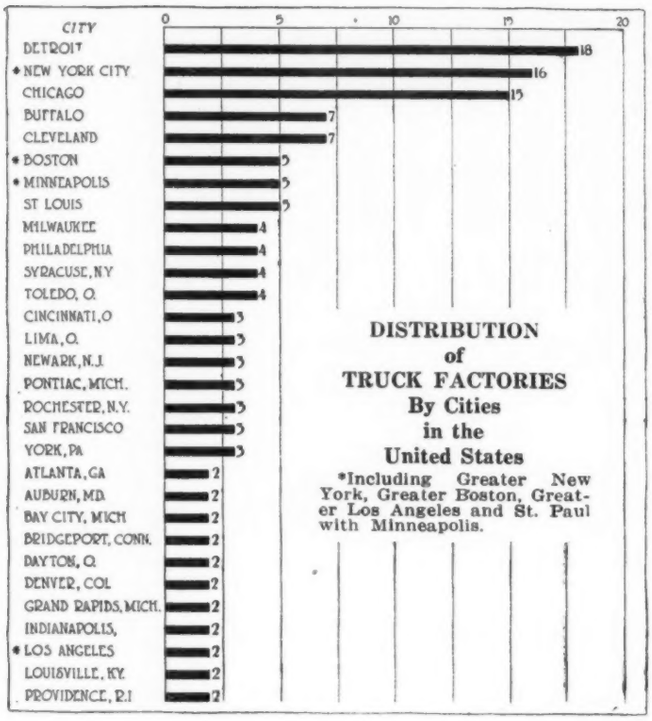
Every civilized man now knows that the armies of the belligerents depend for everything, almost, upon their mechanical transport. That men, food and goods of warlike nature need the motor truck more than the horse; that animal transport is of infinitely less importance than automobile.

It has supplied a market, for war has stripped Europe of its horses and depleted the supply of animals throughout the globe. Every merchant who has to handle goods must for ten years and more to come pay a higher price for animals than ever in history. For years it will be actually hard to obtain horses for ordinary trade purposes throughout Europe. Hence the economies of motor transport, for goods will be obtainable at a capital outlay exceeding that necessary for horse equipment by a smaller amount than ever before.

Thus it may be said with conviction that if war has brought prosperity to the commercial motor vehicle industry, this prosperity will be one of the all too few *good* things that war will leave behind it when the events of the present have become but a nightmare memory.

We have seen throughout the world a year in which the domestic demand for trucks has eclipsed all previous records—a year in which the export demands have eclipsed all previous records also, *apart from war orders*. Between January, 1914, and January, 1917, the motor truck comes into its own.

In 1915 competition in the truck field has been less



keen for two reasons. One is that the firms securing war orders have had so many less trucks to dispose of domestically. In round figures, 24,000 trucks have been exported, and that 24,000 represents just about 30 per cent of the total output. You cannot remove a third of an industry's product without easing competition in the disposal of the remaining two-thirds.

The other reason is that for the 74,000 trucks which were sold in America last year there were more than that number of buyers. The demand has exceeded the supply, and selling is easy under such a condition.

From these generalities there arise many interesting questions for speculation and analysis. For instance, it may be asked what effect has the absorption of certain makes of trucks for war purposes had upon the domestic trade of these manufacturers? Several of the leading makers of trucks in America have secured orders covering a very large share of their output. Is their trade eventually to gain or lose by this war business?

This is a question that each man must answer as he sees it, but it is easy to observe that those firms who are enjoying the war orders are mostly also enjoying a home demand for their trucks greater than ever before. It seems that each war supplying firm has had a row of buyers sitting on its doorstep waiting patiently for such odd trucks as they could snatch. Some of the concerns most deeply involved have, by increasing their capacity, been able to enlarge their domestic sales as well as taking on a few thousand foreign orders.

We have to-day in the truck field full manufacturers who make every part of their trucks, partial manufacturers who buy some parts and make others, and assemblers who make none of their parts. The latter lead, as in the passenger-car field.

Looking around we can see the unmistakable nuclei of great truck-assembling factories with an easily traceable future leading up to outputs of 10,000 or more chassis per year. We see factories making nothing but truck axles, nothing but truck motors, all building, all adding new equipment. This development is natural, was bound to take place, but had it not been for the war it would have been much longer in reaching its present stage, perhaps.

We have said that the removal or partial removal from the competitive home market of some of our big producers has helped the smaller men, and it is reasonable to ask what may then happen when the former have completed their war contracts. One can but speculate, but there is good reason to assume that the other firms have made such good use of the opportunity offered them that their position will be unassailable. The present American demand is capable of absorbing many more trucks than are now available. The world is able to take five times the number, so there should be no room for doubt as to the prosperity of the next few years not merely continuing but growing even greater.

Export Field is Wide

What markets there are in the world as yet hardly touched. All Europe is waiting for the inexpensive American commercial vehicle as well as for her own more costly product. There is room, after the war, for all the outputs of all the European factories and half those of the American plants as well. There is the British Empire, starved for supplies of motor vehicles of all kinds. There is Russia in Asia, where a tremendous wave of civilizing development is looked for after the war. By war a good half of the

Few Local Manufacturers

Below appears a tabulation of manufacturers classified according to markets catered to:

Class of market	Percentage
International	37 1/3
Sectional, a group of states	37 1/3
National, the whole country	16
State	6 2/3
Local, confined to a city or county	2 2/3

Most Makers Build Bodies

Below, in percentages, is given the different policies in regard to factory-built bodies:

Body policy	Percentage
Standard bodies supplied	76
Stripped chassis only	13 1/4
Seldom supply bodies	8 3/8
All chassis sold with bodies	2 3/8

Many Concerns Extend Credit

Credit policies of different manufacturers are given as to per cent in the table below:

Credit policy	Percentage
Have a credit scheme	46
Refuse to grant credit	40 1/2
Leave it to banks and credit brokers	5 3/8
Rarely grant credit	4
Leave matter to dealers	2 3/4
Extend credit locally only	1 3/8

world's road-transport vehicles, animal and mechanical, have been used up—destroyed forever. That the animal part will ever be replaced fully is more than doubtful, so the mechanical will be needed more than ever. No longer will it require educational work lasting over months to sell a truck, for there are hundreds of thousands of buyers waiting check book in hand for the chance to take delivery.

So much for the general situation as regards sales of the present and of the future. Internally, apart from the overseas market, there are changes to be observed which have an effect upon the whole situation.

For instance, the use of the trailer is growing immensely, and it is enlarging the scope of a truck. It is allowing a man with much to haul, in suitable country, to haul it more cheaply; it is making the motor truck still more economical in certain classes of application. The truck makers have been slow to approve the trailer, to-day none of them are actively opposed to it, most of them are ready to approve it within reason, and the balance approve it with certain restrictions as to loading and general usage. The present position is that the trailer will be used whatever the truck maker may think about it, so that the trailer may be regarded as having been forced upon the truck industry, the latter not being unwilling but merely a little coy regarding its new partner.

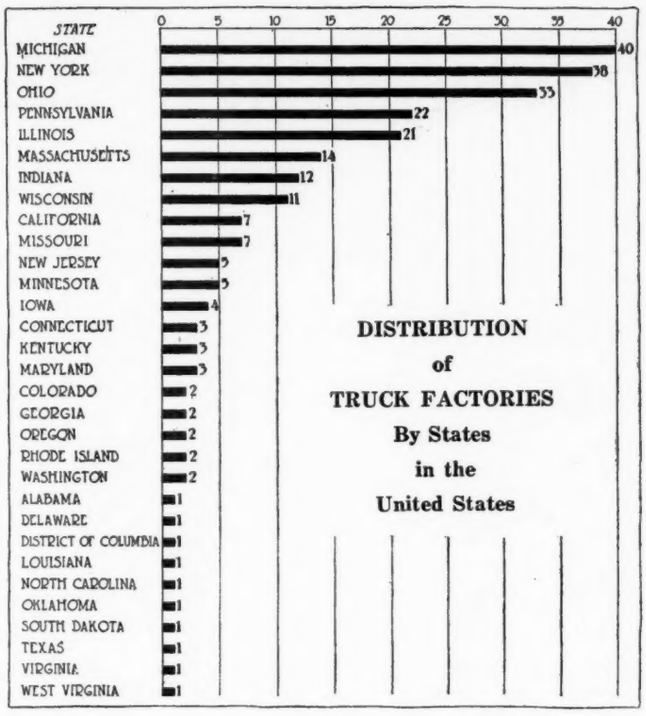
That the great commercial development should have gone hand in hand with engineering progress is natural; it is almost a law that one sort of progress should be accompanied by another, and thus we see the truck of 1916 a distinctly better machine as well as a distinctly cheaper one, on the average.

Methods of commercial handling of the business have changed a little also. There is a distinct increase in credit selling where the makers are absolutely satisfied that the buyer will find the use of the truck a real advantage. To take greater care in selecting credit customers and to be more ready to give credit to those who deserve it is the spirit of the hour. That the truck industry is being regarded rather more hopefully and confidently by the banking interests is also a fact, and doubtless this is partly owing to the creditable showing of the industry during the year.

There have been a number of reorganizations tending toward economy, there have been many new firms come into the business, but we have seen extremely few collapses, few instances of frenzied methods of business. It is as though every man in the truck trade was planning to make it his life's work; it is an industry lately almost untouched by that variety of speculator which the solid financial interests of the country distrust.

We have lately had occasion to remark that never did the immediate future of the passenger-car trade appear so fortunate. That we may truthfully say the same of its sister industry is much more than a happy coincidence. The purpose, the value—in a word the *efficiency* of the automobile was put to the supreme test in the fall of 1914.

The first six months of war proved that neither the truck trade nor the car trade could be injured by civilization's greatest catastrophe; proved that the automobile industry, in the widest sense of the word, is now one of the world's greatest necessities.



Most Trucks Are Assembled

Below are tabulated percentages of makers of motor trucks according to three methods:

Method of manufacture	Percentage
Assembled from standard parts	65 2/3
Partially assembled	23 1/3
Manufactured by maker	11

Trailers Are Generally Approved

The following symposium represents current opinion as to trailers among truck companies:

Trailer policy	Percentage
Approved	35 1/2
Not indorsed	18 3/4
Provision made for attachment	15 1/4
Indorsed under restrictions	13 1/3
Noncommittal	10 2/3
Optional with purchaser	5 1/4
Indorsed for country work only	1 1/4

Starter Question Unsettled

In the table below sentiment among builders is tabulated as to electric systems:

Electric starter policy	Percentage
Supplied on buyer's option	31 3/4
Not indorsed	22 2/3
Approved	21
Refuse to provide	7 1/3
Installed as stock equipment	6 1/3
Electric lighting only supplied	4 1/2
Noncommittal	3 2/3
Will be stock equipment later	1 3/4
Used on light capacities only	1

Truck Design Shows Many Changes

Worm Drive Gains Greatly—Average Capacity Enlarged—General Simplicity Improved

By J. Edward Schipper

TWO thoughts, either of which may be dominant according to the viewpoint taken, are suggested by a study of the past year in the motor truck industry. First, from the economical standpoint, trucks are better adapted to the particular task for which they are used than ever before. Secondly, from an engineering standpoint the mechanics and design of the vehicle have progressed far beyond the usual normal advance for a year. Behind these two conditions there are broad underlying reasons which at first sight would seem only indirectly connected with industrial and mechanical progress, but which on close examination prove to be the immediate cause of development.

Worm Drive Gains 100 per Cent

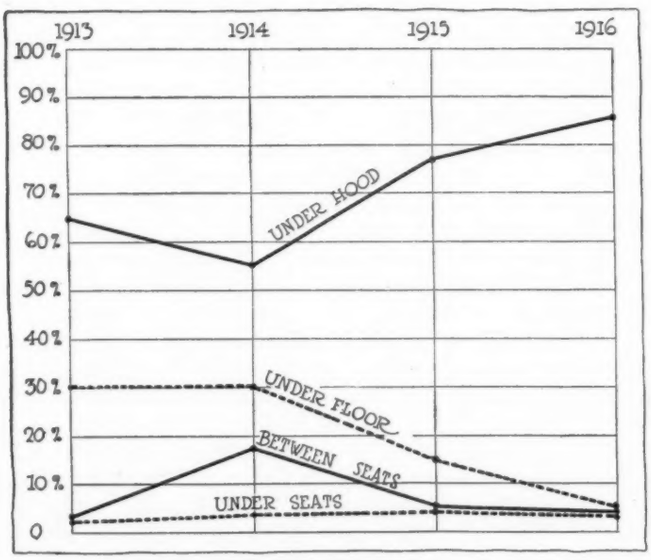
For instance, it seems far-fetched to suggest that Austria's ultimatum to Servia has anything to do with the fact that worm drive has increased over 100 per cent during one year on American motor trucks. And yet, the great war, which that ultimatum, like a torch, kindled throughout Europe, has had more to do with the phenomenal development of the motor truck industry in the United States than can possibly be conceived, except by careful analysis. The percentage of the $65,000,000 received from foreign countries for American trucks that found its way into the engineering departments of the manufacturers has done wonders in the improvement in design. The vast demand had enabled manufacturers to clean their stocks and start afresh on what was realized to be the best practice but which required great sums of money to put in operation. Better graduated capacities, better power plants, better power transmission systems and more efficient control layouts can be directly laid at the door of the greatest year ever known for export business.

One of the first things which manufacturers have done since the opportunity has been offered to supply what previous experience has shown to be essential for success is carefully to scrutinize the capacity problem. There have been some remarkable tendencies in this direction during the past year. The high spot is the development of the 2-ton truck. The overloaded 1-ton and 1½-ton vehicle is passing away, and in its place consumers who formerly through false economy believed that they could carry an occasional high overload are coming to realize that this is a mistake. The average capacity of gasoline motor trucks for 1915 was 4500 lb. For 1916 the average carrying capacity is 4840 lb. This is an increase of 340 lb. per vehicle, or approximately 7½ per cent.

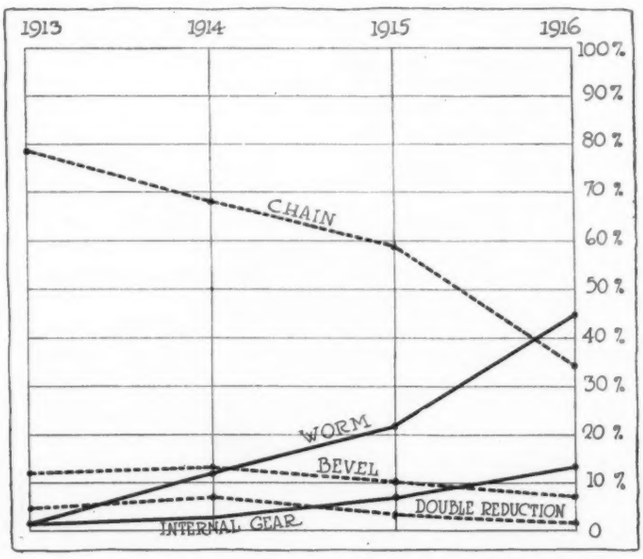
This change in the average capacity is more significant than that it merely represents an increase in the size of the body and the springs on the part of the maker. The manufacturer must supply what the consumer demands, and the fact that the capacity is higher shows that the consumer is buying larger trucks—not because the individual loads moved are any greater than they were a year ago, but because he is willing to pay relatively more for the truck and get what is economically correct.

Coming to the other great development of the year, shaft drive: this is another instance where the purchasers' wants are expressed in tangible form. Public opinion demands the worm drive, and the result is that chain drive has fallen from 58.7 per cent in 1915 to 33.4 per cent in 1916. Worm drive has increased from 21.5 per cent to 44.7. Internal-gear drive has increased from 7.3 to 12.2 per cent, while bevel drive has fallen from 10 to 7. Silence in truck operation has been demanded, and shaft drive is proving to be the answer. When a man buys a commercial vehicle he looks at the question from a business standpoint. In the first place he wants good service from the vehicle. This, in the light of present development, he has a right to expect, and he will receive it. He also wants ease of riding as a protection to the chassis and of the load, should the latter be fragile.

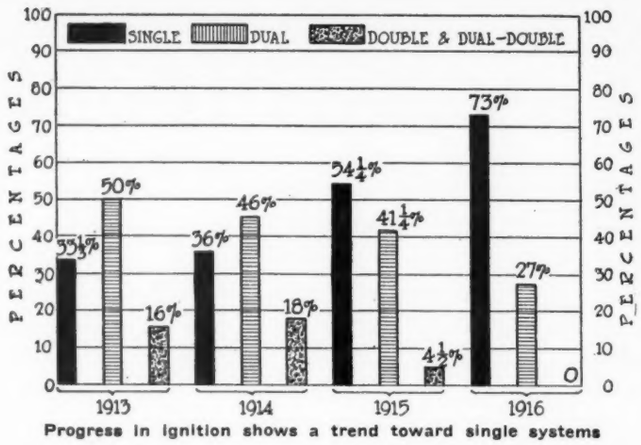
Noise, parts to clean, parts to replace and other inconve-



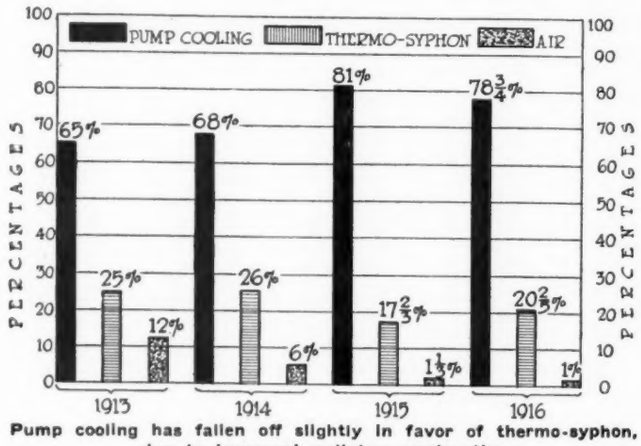
There is a marked trend toward the motor-under-hood construction



A feature of the year is the great gain of shaft drive



Progress in ignition shows a trend toward single systems



Pump cooling has fallen off slightly in favor of thermo-syphon, due to improved radiator construction

niences must be eliminated. When an intending purchaser is shown two trucks both doing their work equally well, one in silence and the other with noisy effort, he quickly turns to the quieter; this also for good business reasons.

As happens in every industry, as developments go on prices can be cut. More efficient tools, better design and big production have been the factors which have cut the prices in the manufacture of motor trucks. In 1915 the average price of a truck was $2,528. For 1916 the price is close to $2,413.

Better Trucks at Lower Prices

Trends in truck design follow somewhat along the lines of those in passenger-car work. The careful concentration on higher efficiency carries the two branches of motor car design along lines that are, in many instances, parallel. This is evidenced in the power plant to a great degree. In the first place the location of the motor under the hood instead of in less accessible locations is growing. Last year, 77 per cent of the chassis had the motors under the hood and in 1916 the percentage is 86. The gain in the under-hood location has been due to the falling off of the under-floor type. This has dropped from 13 per cent in 1915 to 4.2 per cent in 1916.

It would hardly be expected that the multi-cylinder motor would find favor in the truck field. This supposition is borne out and over 96 per cent of all gasoline commercial vehicles have four-cylinder motors. Sixes are represented by 1 per cent and twos by 2.4 per cent. This is the first year in a long time that there has been no representation of the three-cylinder two-cycle design, but it has now dropped to zero. The Duryea two-cylinder two-cycle delivery vehicle is the sole survivor of the two-stroke tribe.

Another way in which power plant design for the commercial vehicle parallels that of the passenger car is in the size. It is becoming smaller as time goes on and greater efficiency is obtained from smaller displacements. The average of all 1915 motors had a bore of 4.16 and a stroke of 5.25 in. The average 1916 truck motor is a 4 by 5.20 in. The smaller motor represents the trend toward compactness and this is further carried out by an increase in the percentage of block-cast cylinders from 54.2 in 1915 to 59 for 1916. To further increase the compactness of the average motor the T-head percentage is suffering in comparison with the gains made by the L-head. There are only 14 per cent which are T-heads now as compared to 17.5 per cent a year ago. The L-head is used on 82.3 per cent.

With the compact block casting with the neat L-head cylinder shape representing the average of truck design due to its preponderance in the percentage tables, it will not be surprising to note that the same trends toward compactness and simplicity will be found throughout the chassis. Take for illustration thermo-syphon cooling which shows a slight gain, and another point of great importance, the unit power plant which has jumped in one year from one-third of the installations to over one-half, the percentage readings for 1915 and 1916, respectively, being 33 and 52.2; the amidships location has gained 5.75 per cent over a year ago, this being due to the more extensive use of worm drive. This involves in some cases great shaft lengths which may very conveniently be reduced by placing the gearset mid-length of it, thus cutting down the free length. The unit jackshaft locations loss has been commensurate with the reduction in the number of chain-driven models.

Apropos of the question of driveshaft lengths, this is a problem introduced by shaft drive which is as yet unsolved. A shaft of too great length will whip and whirl in action, to the great detriment of its universals and the end bearings. One

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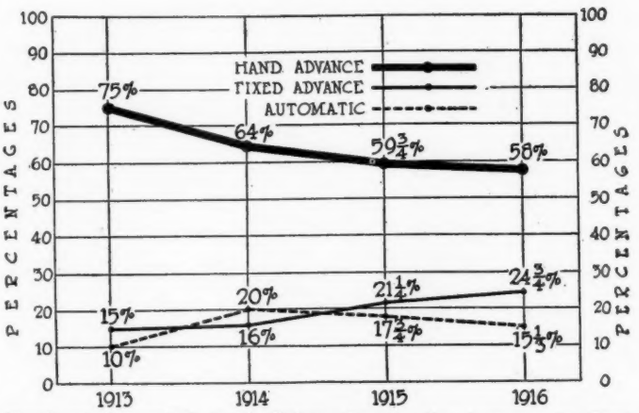
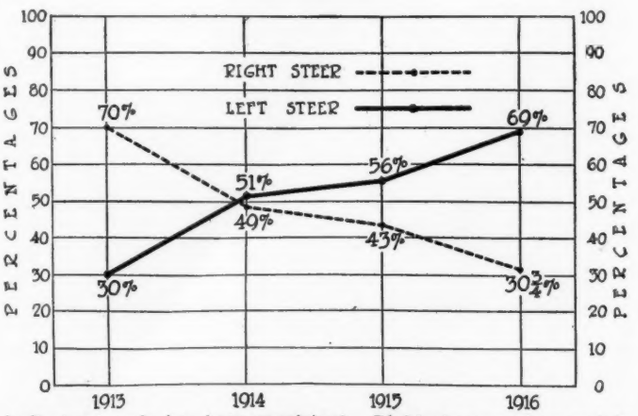


Hand spark control is declining, due to the increase in fixed spark systems



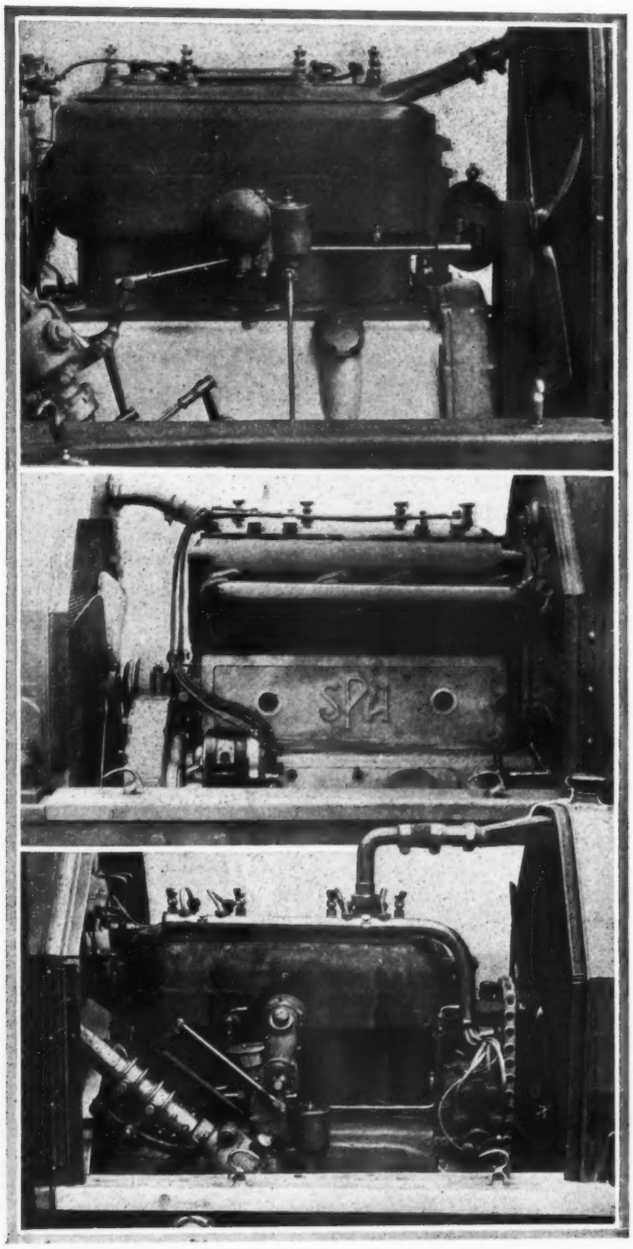
Left steer's gain has been consistent. Right steer survives mainly for export sale

Italian Truck Makers Flourishing

Plants Are Able to Supply Other Countries as Well as Italian Army—Many New Designs—Fiats Predominate

By W. F. Bradley

Paris correspondent of THE AUTOMOBILE, *recently returned from examining the busy and prosperous automobile and motor truck industry in Italy. The following is the first of a series of articles on the subject and reviews the truck field*



Top—Scat motor for 4-ton army truck. Four-cylinder block 3.9 by 5.9-in. bore and stroke
Middle—Heavy duty Spa 3.7 by 7.8-in. bore and stroke for gun-carrying truck. Splitdorf magneto is fitted
Bottom—Lancia 2-ton truck, 3.9 by 5.5-in. bore and stroke motor. Note wood fan of aeroplane type

WITH a 700-mile front, it is obvious that the Italian army must make a very extensive use of automobile trucks. Prior to the war Fiat was the only firm producing trucks in big quantities and, although all other firms have devoted their attention to army vehicles, Fiats still predominate. This company's output is sufficient to supply the Italian army and leave a surplus for England, France, Belgium and Russia. The biggest type used in the Italian army is a 4-ton truck, which is of course a specially designed truck proposition; the smallest are 1-ton trucks on pneumatic tires, generally with twin tires on the rear wheels.

All Fiat trucks of 2-ton capacity and upward have inclosed chain drive; Spa, another big maker of trucks, also uses inclosed chains for final drive. Scat, the only other firm specializing in trucks, uses internal gear drive. These three firms are the only ones having paid really serious attention to truck design before the war, and building a truck which is not a touring car development. These firms, as well as all the others in Italy, are building shaft and bevel drive trucks of 1-, 1½- and 2-ton capacity, which are really nothing more than heavy touring cars. The greater proportion of these 1,-1½- and 2-ton trucks are equipped with pneumatic tires, singles on the front wheels and twins on the rear.

No European army employs such a proportion of pneumatic-tired trucks as the Italian. The explanation is that the authorities wished to make use of trucks built in the country, and it was quicker for the manufacturers to fit a special rear axle and strengthen up the touring chassis generally, equipping it with twin pneumatics, than to get out special truck designs. It is certain that the arrangement is not the most economical, for all the Italian trucks are driven too fast and tire upkeep must be enormous.

Disk Wheels for Small Trucks

One of the distinctive features of Italian construction is the use of disk wheels for trucks up to 2-ton load. These wheels are detachable by unscrewing five or six nuts, and are very easy and cheap to construct, for they consist merely of a stamped steel disk riveted, and welded to a steel rim. The same type of wheel has been put on the market in France by Michelin, and is being used to a moderate extent for touring cars, but very little for trucks. In Italy, on the other hand, the disk wheel is used on all Fiat light trucks, this firm manufacturing them in its own shops, and on about 80 per cent of the entire Italian output of trucks up to 2-ton capacity. Cast steel wheels are employed almost exclusively for the heavier trucks, although the high price of the castings at the present time—about 17 cents per pound—has caused some attention to be paid to wood wheels. It is found, however, that there is very little saving in price.

It appears to be a general practice for the Italian makers to use close grained cast iron instead of aluminum for their heavy truck crankcases. This is done by both Fiat and Spa. This latter firm does not use paper gaskets at the base of the

cylinders and between crankchamber and oil pan. The surfaces are so finely ground that they can be put together without any joint between them, and there is absolutely no oil leakage. This is done on trucks as well as on touring cars. The interiors of cast-iron crankchambers are painted as a protection against rust.

No Four-Wheel Drives

There appear to be no four-wheel drive tractors in Italy; at any rate none are being made by the Italian manufacturers. Heavy gasoline tractors, intended to operate away from made roads, and designed primarily for the haulage of heavy artillery, are being produced by several firms, notably Fiat, Isotta-Fraschini and Spa, and are claimed to give results equal to those obtained with the all-wheel drive type. The Fiat tractor is a chain-driven machine with 70-hp. motor under a hood, four-speed gearbox, jackshaft and incased chains driving large diameter cast-steel wheels with ribbed faces. Front wheels are fitted with Goodrich single-band tires.

The motor, which has a bore and stroke of 5.1 by 7.8 in., is L-type with cylinders cast in pairs, and is the only non-monobloc casting seen in Italy. Except for the pair casting it does not differ appreciably from Fiat truck motors. It is carried on a sub-frame and has half compression device which automatically retards the magneto, the advance being given with full compression and remaining fixed. On a cold morning it is not likely to be an easy matter to start a motor of these dimensions, and in consequence the starting handle is made of sufficient length for three men to get hold of it.

The position of the water pump is somewhat distinctive on the right-hand side of the motor, in a central position, with an inlet pipe to each group of cylinders. The magneto is immediately to the rear of the pump and driven off the same shaft. The gilled tube radiator is mounted in trunnions, and has a whistle in the filler gap, so as to give warning to the driver if steam begins to form.

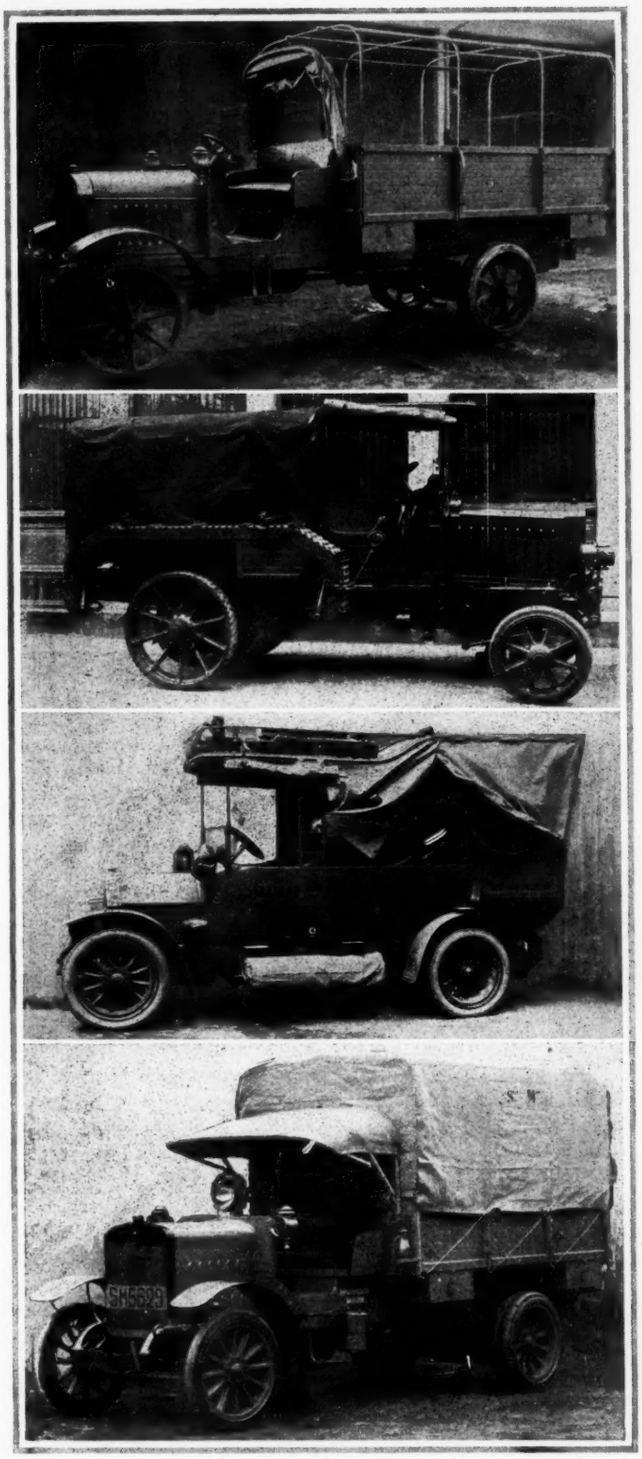
Cross-Members and Gussets for Strength

A very rigid chassis construction is obtained by closely placed cross-members and gussets. Between the motor and gearbox is a cast-iron housing attached direct to the frame members, containing the gearshifter mechanism, the brake control, and silent chain drive from main shaft to the winch shaft running alongside the left-hand frame member. It is by means of a dog-clutch, operated by the change speed lever, that the driving chain can be put into motion, all the gears then being locked in neutral.

Differential Lock on Fiat Tractor

The winch is mounted horizontally within the rear of the chassis and has about 50 yd. of ½-in. steel cable. There are guides on the chassis to allow the cable to be brought forward for hauling a vehicle in front without touching any of the mechanism. A differential lock is fitted; there are two water-cooled brakes on the jackshaft and on the rear wheels. The jackshaft brakes are operated together by pedal through a balance lever, but have a special mechanism by which they can be applied separately when going round sharp mountain turns. The chain cases are a stout casting, with sheet metal facing, having the radius rods combined with them and capable of taking the weight of the vehicle if the road wheels sink in soft ground.

All shackle pins are of big diameter and are bronze bushed. The rear spring shackles have a big oil reservoir cast with them, so that lubricant is automatically fed to the shackle pins. Spring clips are not often used on Italian trucks. Instead, the springs have a groove down their full length, to prevent them splaying sideways, and are assembled by being forced into a forged box, which is bolted to the spring seating on the axles. This does away with the center bolt and by rea-



A group of products of the Italian motor truck factories which are designed especially for use by the Italian army and comprising motor trucks, tractors for hauling heavy guns and special constructions for searchlight work. Note the camparatively short wheelbases of the vehicles and their simple but substantial construction, rendering them eminently suitable for field work of the roughest sort. Some of the chassis details are illustrated on pages 62 and 63

Top—Itala army type 3-ton truck

Upper Middle—Fiat military tractor used in the Alps for hauling heavy guns. Note flexible band for attaching to rear wheels. Goodrich band tires are used in front

Lower Middle—Fiat automobile searchlight for Italian army

Bottom—Diatto 3-ton truck for Italian army

son of the bigger surface holds the leaves together more effectively than a single bolt. Scat has extended this idea to touring cars by putting the springs through the axle.

Can Be Caterpillar at Will

One of the patented features of the Fiat tractor is the caterpillar band attached to the driving wheels. When working under normal conditions, these bands are carried on a kind of platform forming a rear wheel fender. There are projecting studs from the inner face of the rear wheels, by means of which the bands are attached to the wheels. By means of these bands the tractor is able to operate across country and, it is claimed, can haul loads into positions inaccessible to the rubber-tired four-wheel drive tractor.

The tractor carries a useful load of 5 to 6 tons, and can haul a load of 20 tons up a 6 per cent gradient without bands on the rear wheels. On a 12 per cent gradient it can haul 10 tons.

With the bands fitted to the rear wheels, a load of 100 tons can be hauled over level roads, 35 to 40 tons on a 12 per cent gradient, and 20 to 25 tons on a 15 per cent gradient. The tractor alone weighs a little more than 12 tons and will climb a 30 per cent gradient. These machines were under test for a long time on Alpine roads and are now being used very extensively by the Italian army in their mountain operations against the Austrians.

Spa Carries 6-In. Gun

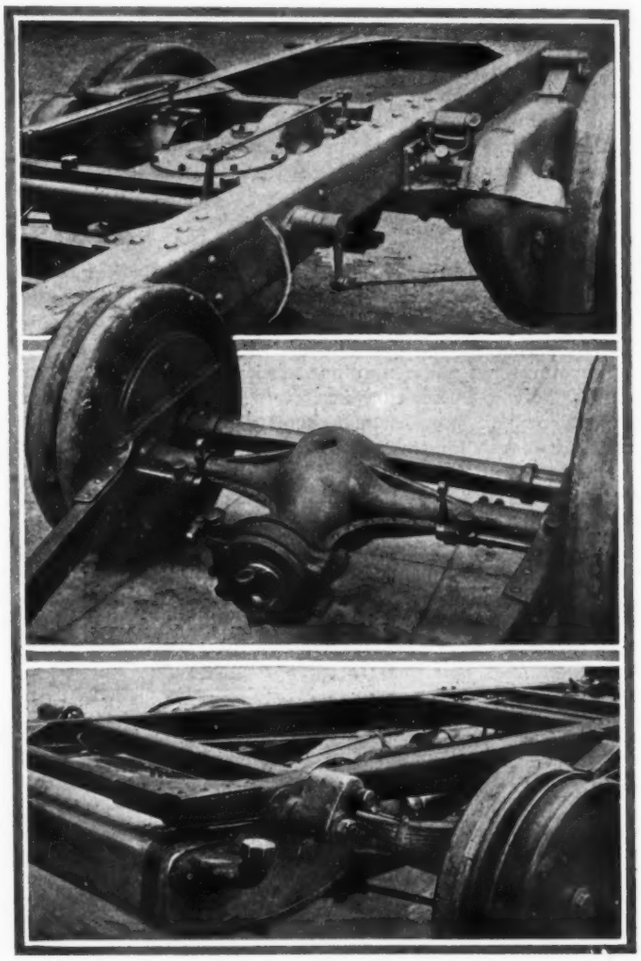
Spa is building a very heavy short-wheelbase chassis designed to carry a 6-in. gun. The fitting of the gun is undertaken by the Italian artillery department, and particulars are not for publication. It is understood that jacks are fitted to the chassis, so that all load is taken off the springs when the gun is fired. This is doubtless somewhat similar to the system adopted by the French artillery for their 75 mm. guns. The Spa chassis is driven by a slow speed block motor of 3.7 by 7.8 in. bore and stroke.

This is one of the most compact and neatest truck motors ever produced. The water pump is within the cylinder casting, fan and pump being driven off the same shaft. There is no intake manifold, for the throttle is inside the casting, only the float chamber being external. The magneto—a Splitdorf—is mounted on the valve side, just to the rear of the timing gear housing, where it does not interfere with the accessibility of the valve stems. Lubrication is under pressure to all parts, including the wristpin.

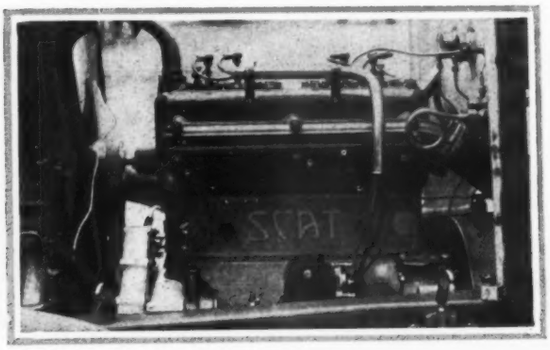
Although similar in external appearance to the touring car type, the truck motor differs by reason of the external exhaust manifold, cast iron instead of aluminum for crankchamber, and the lower number of revolutions at which it is designed to run. Transmission is through four-speed gearbox to jackshaft, with double water-cooled brakes mounted on it, and final drive by inclosed side chains.

Many Special Army Trucks

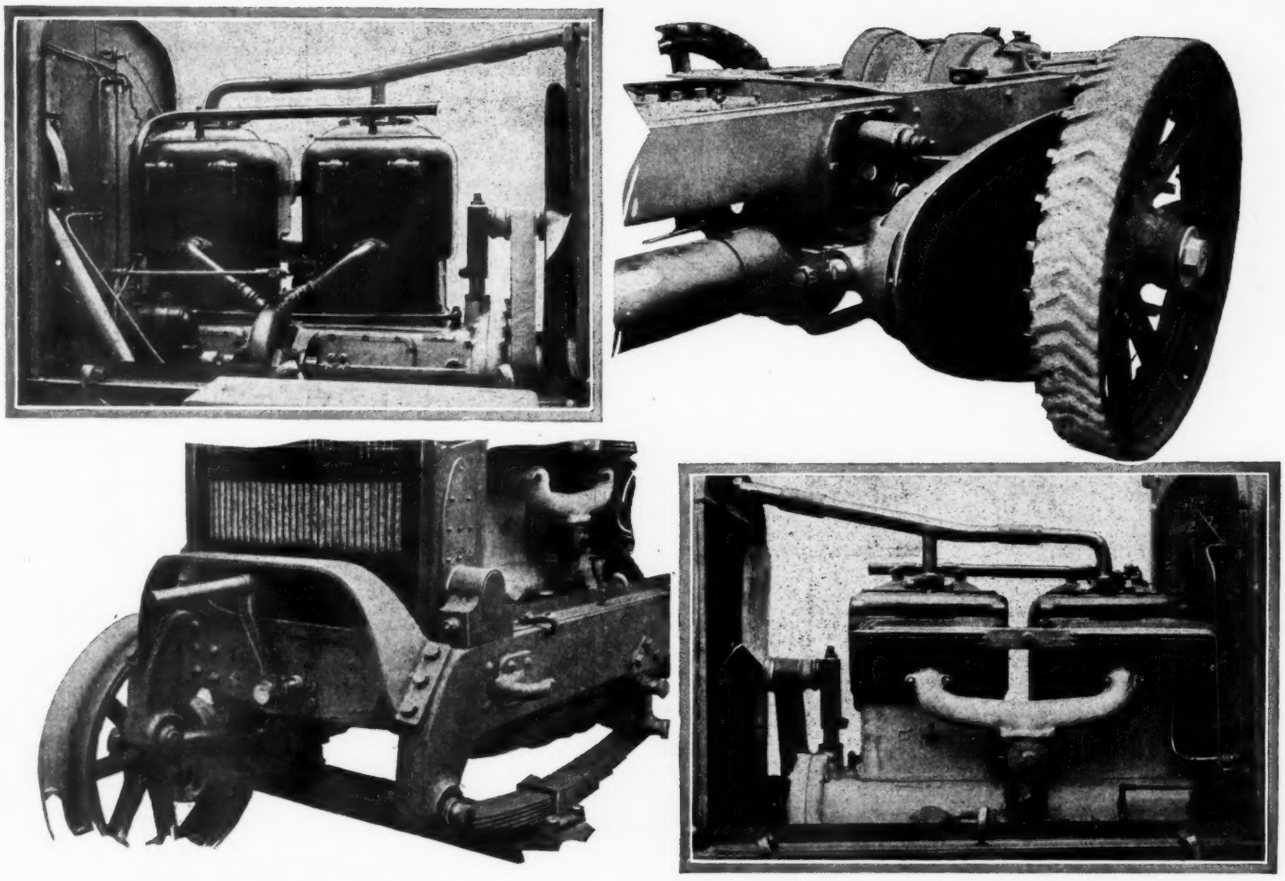
A large number of special vehicles for military operations are being produced by the Italian factories. Fiat is build-



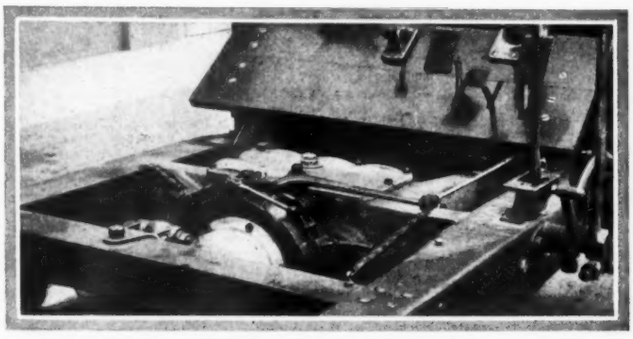
Top—Rear shackles of Lancia 2-ton truck. This chassis has disk wheels with twin pneumatic tires
Middle—Internal gear drive on Scat 4-tonner with foot brake behind rear universal
Bottom—Jackshaft and inclosed chain drive on the Spa heavy duty truck



Above—Motor of Scat 2-ton army truck. Note cylinder casting does not have separate water header. Middle—Scat 3-ton truck army type. Right—Aluminum dash used on the Scat truck. Note corrugated steering wheel



Four views of the Fiat army tractor, showing some of its constructional features. Upper left—Motor of 5.1 by 7.8-in. bore and stroke. Note position of water pump and inlet pipes. Upper right—Rear of chassis. Note cast-steel wheels, which set across frame and spring shackle, forming oil reservoir. Lower left—Radiator is mounted in trunnions with substantial guard. The starting crank is large enough for three men to take hold at once. Note spring assembly. Lower right—The other side of the motor. Note the neat arrangement of the exhaust manifold



Lancia 2-ton chassis used by the British and Italian armies as an armored car

ing numbers of searchlights carried on a 2-ton chassis using pneumatic tires. The dynamo is mounted over the gearbox and driven by inclosed silent chain. The searchlight, which has a face diameter of 35 in. is mounted on a wire-wheel bogey. It is brought out of the car on rails and can operate several hundred yards from the generating car. A similar type of chassis is employed for wireless telegraphy. The English and French method of carrying gasoline is by means of 2-gal. cans. The Italians are making use of tank wagons, with pump and measuring instrument mounted on the rear end of the tank, this proving a much more economical and satisfactory manner of handling gasoline than the use of cans. Armored cars, generally fitted with two machine guns, are being produced in moderately large quantities for the Italian and other armies.

The armor plating is chrome-nickel steel 5 mm. thick capable of turning a rifle bullet at close range. Practically all these cars have twin pneumatic tires on the rear, with a housing around them brought as low as possible compatible with clearance. In some cases band tires are fitted on the front wheels, without any protection, the wheels being either cast steel or steel disk type. Other special machines are motor workshops, aeroplane tenders and trailers.

Before the war Italy did not possess a great number of automobile drivers, for practically her entire fleet of automobiles consisted of passenger cars. Thus, since the army has put into service several thousands of automobiles and trucks, it has been necessary to train drivers for them, with the result that more or less green men have been in charge of military material. The situation, however, has not been as difficult as in England and France, where there is in addition to the military fleet a very important commercial motor fleet for which drivers are found with difficulty.

When war broke out the Italian military authorities requisitioned practically all private cars. This part of the Italian military organization does not appear to have been managed in a very satisfactory manner. It is declared that the officers alone were judges of the value of a car, with the result that in some cases a fancy price would be paid, and in others the owner would get much less than the real value of his machine. Experience has shown that the best scheme is that in force in France, where the impressment officers have to work to a definite scale, based on the number of cylinders, horsepower, age, type of body, nature of tires, etc. Under this scheme the owner is at a disadvantage if his car has just come out of the factory or has just been completely overhauled, and the state loses if the car has been run as long as possible without extensive repairs.

Technical Specifications of Gaso

Constructional Details of 408 Gasoline and Gasoline-Electric Full Particulars of Motor, Trans

Name and Model	Capacity in Pounds	Price of Chassis	Wheelbase in Inches	TIRES			MOTOR											
				Kind	SIZES IN INCHES		Location	No. of Cylinders	No. of Crankshaft Bearings	Bore and Stroke	N.A.C.C. Hp.	Cylinders Cast	Valves Placed	COOLING		IGNITION		
					Front	Rear								Water Circulation	Radiator Core and Case	Type	Make	Spark Advance
A & B	6,000	.....	144	solid	48x3½d	48x3½d	under hood	4	3	5½x4½	42.64	pairs	right	gear	fin-sheet	dual	Bosch	hand
A & B	10,000	.....	144	solid	48x3½d	48x5d	under hood	4	3	5½x4½	42.64	pairs	right	gear	fin-sheet	dual	Bosch	hand
Acme	4,000	2,000	148	solid	36x4	36x6	under hood	4	3	4½x5½	27.20	block	left	cent	fin-sheet	sing	Eisemann	fixed
Adams A	2,000	1,850	136*	solid	36x3½	36x4	under hood	4	3	3¾x5½	22.50	block	right	cent	fin-sheet	sing	Eisemann	auto
Adams D	3,000	2,300	136*	solid	36x3½	36x3½d	under hood	4	3	4½x5½	27.20	block	right	cent	fin-sheet	sing	Eisemann	auto
Adams E	5,000	2,500	140*	solid	36x4	36x4d	under hood	4	3	4½x5½	27.20	block	right	cent	fin-sheet	sing	Eisemann	auto
Armleder HC	4,000	2,500	148*	solid	36x4	36x7	under hood	4	3	4½x5½	27.20	block	left	cent	cell-sheet	sing	Bosch	hand
Armleder HW	4,000	2,800	148*	solid	36x4	36x7	under hood	4	3	4½x5½	27.20	block	left	cent	cell-sheet	sing	Bosch	hand
Armleder EC	5,000	2,800	148*	solid	36x4	36x4d	under hood	4	3	4½x5½	27.20	block	left	cent	cell-sheet	sing	Bosch	hand
Armleder HW	7,000	3,500	156*	solid	36x5	36x5d	under hood	4	3	4½x5½	32.40	pairs	left	cent	fin-cast	sing	Bosch	hand
Atterbury 6B	2,000	1,775	140½	solid	36x3½	36x5	under hood	4	3	3¾x5½	22.50	block	left	cent	fin-cast	sing	Bosch	fixed
Atterbury 6C	4,000	2,375	153½	solid	36x4	36x4d	under hood	4	3	4½x5½	27.20	block	left	cent	fin-cast	sing	Bosch	fixed
Atterbury 6D	7,000	3,175	167½	solid	36x5	40x5d	under hood	4	3	4½x5½	32.40	pairs	left	cent	fin-cast	doub	Bosch	hand
Autocar 21F	4,000	1,650	97	solid*	34x4*	34x5*	under seats	2	2	4½x4½	18.10	sing	right	cent	fin-sheet	sing	Bosch	fixed
Available	2,000	1,500	132*	solid	36x3	36x4	under hood	4	3	3½x5	22.50	block	right	thermo	cell-sheet	sing	Bosch	fixed
Available	4,000	2,000	144*	solid	36x4	36x7*	under hood	4	3	4½x5½	27.20	block	left	cent	cell-sheet	sing	Bosch	fixed
Available	7,000	3,000	opt	solid	36x5	40x5d	under hood	4	3	4½x5½	32.40	pairs	left	cent	cell-sheet	dual	Bosch	fixed
Avery C	2,000	1,690	128	solid	34x3½	34x5	under hood	4	.....	4½x5½	27.20	block	left	cent	fin-sheet	dual	Heinze	hand
Avery B	4,000	2,700	128	solid	36x4	36x3½d	under hood	4	.....	4½x5	36.15	sing	left	cent	fin-sheet	dual	Eisemann	auto
Avery B	6,000	3,200	128	solid	38x5	38x4d	under hood	4	.....	4½x5	36.15	sing	left	cent	cell-sheet	dual	Eisemann	auto
Avery A	6,000	2,500-c	140	wood	38x5	38x4d	btw seats	4	.....	4½x5	36.15	sing	left	cent	fin-sheet	dual	Eisemann	auto
Avery B	10,000	4,500	128	solid	38x6	38x5d	under flr	4	.....	5½x5½	44.20	pairs	opp	cent	cell-sheet	dual	Eisemann	auto
Barker U	2,000	2,000	130	solid	42x3½	42x5	under hood	4	.....	4 x5	25.60	block	left	thermo	cell-sheet	sing	Eisemann	auto
Barker V	4,000	2,400	136	solid	36x4	36x7	under hood	4	.....	4 x5	25.60	block	left	thermo	cell-sheet	sing	Eisemann	auto
Bauer A	1,000	720	100	solid*	36x2½*	36x2½*	under hood	4	2	3½x5	22.50	block	right	cent	fin-sheet	dual	opt	hand
Bauer B	1,500	840	110	solid*	36x2½*	36x2½*	under hood	4	2	3½x5	22.50	block	right	cent	fin-sheet	dual	opt	hand
Bessemer G	1,500	975	124	solid	35x3	35x3½	under hood	4	3	3½x5	19.61	block	right	thermo	fin-sheet	sing	Bosch	hand
Bessemer A	3,000	1,800	136	solid	37x3½	37x5	under hood	4	3	4½x5½	27.20	block	right	cent	fin-cast	sing	Bosch	hand
Bessemer D	4,000	2,000	136	solid	37x4	37x3½d	under hood	4	3	4½x5½	27.20	block	right	cent	fin-cast	sing	Bosch	hand
Bessemer E	7,000	2,800	150	solid	37x5	37x4d	under hood	4	3	4½x5½	32.40	pairs	right	cent	fin-cast	sing	Bosch	hand
Blair 2C	4,000	2,850	121*	solid	34x4	34x3½d	btw seats	4	3	3¾x5½	22.50	pairs	left	cent	cell-sheet	sing	Bosch	fixed
Blair 2D	6,000	3,250	121*	solid	36x4	36x4d	btw seats	4	3	4½x5½	29.00	pairs	left	cent	cell-sheet	dual	Bosch	fixed
Blair 2E	8,000	3,750	135*	solid	36x5	36x5d	btw seats	4	3	4½x6½	32.40	pairs	left	cent	cell-sheet	dual	Bosch	fixed
Blair 2F	10,000	4,500	135*	solid	36x6	36x6d	btw seats	4	3	4½x6½	32.40	pairs	right	cent	cell-sheet	dual	Bosch	fixed
Ballstrom A	1,500	1,200	125*	pneu*	35x4½	35x4½	under hood	4	3	3½x5½	15.64	pairs	head	cent	cell-sheet	.....	.....	hand
Brasie Packet	500	450-c	100	pneu	28x3	28x3	under hood	4	2	2¾x4	12.08	block	right	thermo	fin-sheet	sing	Atw. Kent	auto
Brinton H	1,200	815	98	cush*	33x4	33x4	under hood	4	2	3½x5	16.92	block	left	thermo	fin-sheet	sing	Berling*	hand
Brinton F	5,000	2,250	138*	solid	36x4	36x5	under hood	4	3	4½x5½	27.20	block	left	cent	fin-sheet	sing	Bosch	fixed
Brockway H	2,500	1,600	124*	solid	36x3½	36x4	under hood	4	3	3¾x5½	22.50	block	left	cent	fin-cast	sing	Bosch	fixed
Brockway J	2,500	1,825	124*	solid	36x3½	36x5	under hood	4	3	3¾x5½	22.50	block	left	cent	fin-cast	sing	Bosch	fixed
Brockway I	4,000	1,900	140*	solid	36x4	36x6*	under hood	4	3	4½x5½	27.20	block	left	cent	fin-cast	sing	Bosch	fixed
Brockway K	4,000	2,125	140*	solid	36x4	36x6*	under hood	4	3	4½x5½	27.20	block	left	cent	fin-cast	sing	Bosch	fixed
Buick D4	1,500	1,150	122	pneu	35x5	35x5	under hood	4	3	3¾x5	22.50	pairs	head	cent	cell-sheet	sing	Delco	auto-h
Burford O	4,000	2,000	132*	solid	36x3½	36x3½d	under hood	4	3	3¾x5½	22.50	block	right	cent	fin-cast	sing	Eisemann	fixed
Burford D	7,000	.....	175*	solid	38x5	38x5d	under hood	4	3	4½x6½	32.40	block	left	cent	fin-cast	sing	Eisemann	fixed
Chase A	2,000	1,650	140	solid	36x3½	36x5	under hood	4	3	3½x5½	19.61	block	l & h	thermo	fin-sheet	sing	Bosch	fixed
Chase R	4,000	2,200	160*	solid	36x3½	36x3½d	under hood	4	3	4½x5½	27.20	block	left	cent	fin-sheet	sing	Bosch	fixed
Chase O	7,000	3,300	175*	solid	36x5	36x5d	under hood	4	3	4½x5½	32.40	pairs	left	cent	fin-cast	sing	Bosch	fixed
Coleman J	4,000	2,400	132	solid	36x4	36x3½d	under seats	4	3	4 x5	25.60	block	left	cent	fin-sheet	sing	Bosch	hand
Coleman H	6,000	3,000	138	solid	36x5	36x5d	under seats	4	3	4½x5½	36.15	pairs	opp	cent	fin-sheet	sing	Bosch	hand
Commerce N	1,500	875	120	pneu	34x4	34x4	under hood	4	3	3½x5	19.61	block	left	thermo	fin-cast	sing	Eisemann	fixed
C.T	7,000	4,800	132	solid	36x4d	36x4d	under seats	4	3	4½x5½	36.15	pairs	opp	cent	fin-cast	sing	Bosch*	2-pt
C.T	10,000	5,200	156	solid	36x5d	36x5d	under seats	4	3	5 1/10x5½	41.61	pairs	opp	cent	fin-cast	sing	Bosch*	2-pt
C.T Tractor	.....	5,000	.....	solid	36x4d	36x4d	under seats	4	3	5 1/10x5½	41.61	pairs	opp	cent	fin-cast	sing	Bosch*	2-pt
Continental (C) FL	2,000	1,550	144	solid	34x3	36x4	under hood	4	3	3¾x5½	22.50	pairs	left	cent	fin-cast	sing	Bosch*	fixed
Continental (C) HL	3,000	1,750	144	solid	34x3½	36x5	under hood	4	3	3¾x5½	22.50	pairs	left	cent	fin-cast	sing	Bosch*	fixed
Continental (C) J	4,000	2,100	146	solid	36x4	36x4d	under hood	4	3	4½x5½	27.20	pairs	left	cent	cell-cast	sing	Bosch*	fixed
Continental (C) M	7,000	3,000	168*	solid	36x5	36x5d	under hood	4	3	4½x5½	32.40	pairs	left	cent	cell-cast	sing	Bosch*	fixed
Corbitt B	2,000	2,250	130	solid	36x3½	36x4	under hood	4	3	3¾x5½	22.50	block	left	cent	fin-cast	sing	Eisemann	hand
Corbitt A	4,000	2,500	145*	solid	36x3½	36x3½d	under hood	4	3	4½x5½	27.20	block	left	cent	fin-cast	sing	Eisemann	hand

ABBREVIATIONS: General, *, *with other options;* opt, *optional.* **Price,** -c, *complete with body.* **Tires, Kind,** Pneu, *pneumatic;* Cush, *cushion;* p & s, *pneumatic in front and solid in rear;* s & st, *solid in front and steel in rear.* **Tire Sizes,** d, *dual.* **Motor Location,** btw seats, *between seats;* under flr, *under floor.* **Cylinders Cast,** sing, *singly or individually.* **Location of Valves,** opp, *opposite or T-head type;* top (two cylinder motors only), *L-head cylinder laid horizontal with valves up;* r & h, *at right and in head, L-head cylinder;* l & h, *at left and in head, L-head cylinder;* 2-cyc, *two-cycle motor, no valves.* **Water Circulation,** cent, *centrifugal pump;* gear, *gear pump;* thermo, *thermo-syphon circulation;* air, *air cooled, no water.* **Radiator Type and Case,** fin-sheet, *finned-tube core with sheet metal casing;* fin-cast, *finned-tube core with cast aluminum casing;* sq-t-sheet, *square tube or flat tube core with sheet metal casing;* sq-t-cast, *square tube core with cast aluminum casing;* cell-sheet, *cellular or honeycomb core with sheet metal casing;* cell-cast, *cellular core with cast aluminum casing;* z-z-t-sheet, *zig-zag tube core with sheet metal casing;* z-z-t-cast, *zig-zag tube core with cast aluminum casing;* ring-cast, *copper tube core arranged in a ring about a centrifugal fan with a cast aluminum casing.* **Ignition, Type,** sing, *single;* doub, *double.* **Make of Magneto** (or other sparking device), Atw. Kent, *Atwater Kent.* **Spark Advance** auto *automatic* auto-h, *automatic advance with hand adjustment;* 2-pt, *two-point fixed, battery circuit fixed in retard, magneto in advance.*

line Commercial Vehicles for 1916

Chassis Produced by 150 American Manufacturers, with mission, Control and Equipment

MOTOR						TRANSMISSION								SPRINGS		CONTROL		
GOVERNOR		SPEED					GEARSET											
Type	Drive	Motor in r.p.m	Truck in m.p.h.	Carbureter Make	Lubrication	Clutch Type	Type	Location	Speeds	Total Gear Reduction in High	Final Drive	Torque Taken By	Propulsion Taken By	Front	Rear	Steer	Levers	Name and Mode
none	none			Schebler	circ-spl	none	elec	amid	2	28.00 –1	int-g-f	rad-rd	rad-rd	½-ell	½-ell	right	right	A & B
none	none			Schebler	circ-spl	none	elec	amid	2	28.00 –1	int-g-f	rad-rd	rad-rd	½-ell	½-ell	right	right	A & B
cent	motor	1,200	17	Rayfield	spl-press	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Acme
cent	motor	2,200	25	Zenith	circ-spl	dry-d	selec	unit-j	3	7.45 –1	dbl chn		rad-rd	½-ell	½-ell	left	cent	Adams A
cent	motor	2,200	20	Zenith	circ-spl	dry-d	selec	unit-j	3	7.45 –1	dbl chn		rad-rd	½-ell	½-ell	left	cent	Adams D
cent	motor	2,200	18	Zenith	circ-spl	dry-d	selec	unit-j	3	8.40 –1	dbl chn		rad-rd	½-ell	½-ell	left	cent	Adams E
none	none	1,600	16	Schebler	circ-spl	dry-d	selec	unit-m	3	8.00 –1	dbl chn		rad-rd	½-ell	½-ell	left	cent	Armleder HC
none	none	1,600	16	Schebler	circ-spl	dry-d	selec	unit-m	3	8.00 –1	top worm	springs	rad-rd	½-ell	½-ell	left	cent	Armleder HW
none	none	1,600	14	Schebler	circ spl	dry d	selec	unit m	3	9.00 –1	dbl chn		rad-rd	½-ell	½-ell	left	cent	Armleder EC
none	none	1,600	13	Schebler	circ spl	dry d	selec	unit-m	3	8.75 –1	top worm	springs	rad-rd	½-ell	½-ell	left	cent	Armleder HW
cent	motor	1,200	16½	Zenith	circ-spl	dry d	selec	unit m	4	7.75 –1	top worm	springs	springs	½-ell	½-ell	right	right	Atterbury 6B
cent	motor	1,200	15½	Zenith	circ-spl	dry-d	selec	unit-m	4	8.50 –1	top worm	springs	springs	½-ell	½-ell	right	right	Atterbury 6C
cent	motor	1,125	13	Zenith	circ-spl	dry-d	selec	unit-m	4	10.30 –1	top worm	springs	springs	½-ell	½-ell	right	right	Atterbury 6D
none	none	1,800	25	Stromberg	splash	dry-p	prog	amid	3	7.10 –1	doub-red	springs	springs	½-ell	plat	right	right	Autocar 21F
cent	motor	1,200	18	Stromberg	circ-spl	dry-d	selec	unit-m	3	7.00 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Available
cent	motor	1,200	15	Stromberg	circ-spl	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Available
cent	motor	1,200	14	Stromberg	circ-spl	dry-d	selec	unit-m	3	10.33 –1	top worm	springs	rad-rd	½-ell	½-ell	left	cent	Available
cent	motor	1,200	15	Rayfield	spl-press	dry-d	selec	unit-m	3	7.75 –1	dbl chn		rad-rd	½-ell	½-ell	left	cent	Avery C
l-b	motor	1,200	14½	Rayfield	spl-press	dry-d	selec	unit-j	3	3.50 –1	dbl chn		rad-rd	½-ell	½-ell	right	cent	Avery B
cent	motor	1,200	13	Rayfield	spl-press	dry-p	selec	unit-j	3	3.50 –1	dbl chn		rad-rd	½-ell	½-ell	right	cent	Avery B
cent	motor	1,200	12	Rayfield	spl-press	dry-d	selec	unit-j	3	3.50 –1	dbl chn		rad-rd	½-ell	½-ell	right	cent	Avery A
cent	motor	1,000	10	Schebler	spl-press	wet-d	selec	unit-j	3	12.50 –1	dbl chn		rad-rd	½-ell	½-ell	right	cent	Avery B
none	none	1,500	27	Stromberg	spl-press	dry-p	selec	unit-m	4		top worm	springs	springs	½-ell	½-ell	left	cent	Barker U
none	none	1,500	20	Stromberg	spl-press	dry-p	selec	unit-m	4		top worm	springs	springs	½-ell	½-ell	left	cent	Barker V
none	none	1,500	25	Bauer	circ-spl	wet-d	selec	unit-m	3		doub-red	tor-arm	tor-arm	½-ell	ellip	left	cent	Bauer A
none	none	1,500	25	Bauer	circ-spl	wet-d	selec	unit-m	3		doub-red	tor-arm	tor-arm	½-ell	ellip	left	cent	Bauer B
none	none		21	Rayfield	circ-spl	dry-d	selec	unit-m	3	6.50 –1	int-gear	springs	springs	½-ell	½-ell	left	cent	Bessemer G
cent	motor	1,140	16½	Rayfield	circ-spl	cone	selec	amid	3	7.20 –1	dbl chn		rad-rd	½-ell	plat	left	cent	Bessemer A
cent	motor	1,140	15	Rayfield	circ-spl	cone	selec	amid	3	7.75 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Bessemer D
cent	motor	1,090	12	Rayfield	circ-spl	cone	selec	amid	3	10.33 –1	top worm	springs	rad-rd	½-ell	½-ell	left	cent	Bessemer E
cent	motor	1,100	15	Schebler	circ-spl	cone	ind-c	amid	3	7.67 –1	top worm	sub-f	sub-f	½-ell	½-ell	right	right	Blair 2C
cent	motor	1,100	14	Schebler	circ-spl	cone	ind-c	amid	3	8.67 –1	top worm	sub-f	sub-f	½-ell	½-ell	right	right	Blair 2D
cent	motor	1,000	12	Schebler	circ-spl	cone	ind-c	amid	3	9.33 –1	top worm	sub-f	sub-f	½-ell	½-ell	right	right	Blair 2E
cent	motor	1,100	10	Schebler	circ-spl	cone	ind-c	amid	3	12.00 –1	top worm	sub-f	sub-f	½-ell	½-ell	right	right	Blair 2F
elec		1,200	18	Schebler	circ-spl	wet-d	selec	unit-m	3	6.00 –1	int-g-4	tor-arm	tor-arm	½-ell	¾-ell	left	cent	Bollstrom A
none	none	1,500	30	Carter	circ-spl	none	fric	unit-j	3	4.00 –1	dbl chn		rad-rd	½-ell	½-ell	left	left	Brasie Packet
none	none	1,200	20	Stromberg	circ-spl	dry-d	selec	unit-m	3	6.20 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Brinton H
cent	motor	1,200	35	Stromberg	circ-spl	dry-d	selec	unit-m	3	8.75 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Brinton F
suct	motor	1,300	15	Schebler	circ-spl	cone	selec	unit-j	3	8.25 –1	dbl chn		rad-rd	½-ell	plat	left	cent	Brockway H
suct	motor	1,300	15	Schebler	circ-spl	dry-d	selec	unit-m	3	8 67 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Brockway J
suct	motor	1,300	15	Schebler	circ-spl	cone	selec	unit-j	3	8 25 –1	dbl chn		rad-rd	½-ell	plat	left	cent	Brockway I
suct	motor	1,300	15	Schebler	circ-spl	dry-d	selec	unit-m	3	8.67 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Brockway K
none	none	1,750	30	Marvel	circ-spl	cone	selec	unit-m	3	6.00 –1	bevel	tor-t	tor-t	½-ell	ellip	left	cent	Buick D4
		1,200	15	Zenith	spl-press	cone	selec	unit-m	3	8 50 –1	int-gear	springs	springs	½-ell	½-ell	right	cent	Burford O
		1,000	13	Zenith	spl-press	dry-d	selec	amid	4	8.75 –1	top worm	springs	rad-rd	½-ell	½-ell	right	right	Burford D
suct	motor	1,200	20	Holley	spl-press	dry-p	selec	unit-m	3	6.75 –1	top worm	springs	springs	½ ell	½ ell	left	cent	Chase A
cent	motor	1,200	18	Holley	circ-spl	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell	½-ell	right	cent	Chase R
cent	motor	1,200	14	Holley	circ-spl	dry-d	selec	unit-m	4	9.25 –1	top worm	springs	springs	½-ell	½-ell	right	cent	Chase O
cent	motor	1,000	15	Schebler	pressure	dry-p	selec	unit-m	3		top worm	springs	springs	ellip	½-ell	right	right	Coleman J
cent	motor	1,000	12	Schebler	pressure	cone	selec	unit-j	3		dbl chn		rad-rd	ellip	plat	right	right	Coleman H
none	none		30	Breeze	circ-spl	cone	selec	unit-m	3	6.00 –1	bevel	tor-arm	springs	½-ell	½-ell	left	cent	Commerce N
cent	motor	1,150	12	Stromberg	pressure	none	elec	unit-m	2		int-g-4	springs	rad-rd	½-ell	½-ell	left	cent	C.T
cent	motor	1,350	10	Stromberg	pressure	none	elec	unit-m	2		int-g-4	springs	rad-rd	½-ell	½-ell	left	cent	C.T
cent	motor	1,350	10	Stromberg	pressure	none	elec	unit-m	2		int-g-4	springs	rad-rd	½-ell	½-ell	left	cent	C.T Tractor
suct	motor			Stromberg	circ-spl	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell	½-ell	left*	cent	Continental (C) FL
suct	motor			Stromberg	circ-spl	dry-d	selec	unit-m	3	9.25 –1	top worm	springs	springs	½-ell	½-ell	left*	cent	Continental (C) HL
suct	motor			Stromberg	circ-spl	dry-d	selec	unit-m	3	9.25 –1	top worm	springs	springs	½-ell	½-ell	left*	cent	Continental (C) J
suct	motor		18	Stromberg	circ-spl	dry-d	selec	unit-m	3	10.50 –1	top worm	springs	springs	½-ell	½-ell	left*	cent	Continental (C) M
cent	motor	1,100	16	Stromberg	circ-spl	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Corbitt B
cent	motor	1,100	15	Stromberg	circ-spl	dry-d	selec	unit-m	3	8.67 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Corbitt A

ABBREVIATIONS: (continued). **Governor Type,** cent, *centrifugal;* l-b, *loose-ball;* suct, *suction;* hyd, *hydraulic;* elec, *electric.* **Governor Drive,** motor, *from motor;* d-shaft, *from driving shaft;* f-wheel, *from front wheel;* duplex, *from both the motor and driving shaft by overrunning clutches.* **Lubrication,** splash, *non-circulating or simple splash;* circ-spl, *circulating splash;* spl-press, *splash-pressure;* fuel-inj, *fuel injection, oil mixed with fuel;* pressure, *pressure feed, no splash.* **Clutch Type,** dry-p, *dry plate;* dry-d, *dry multiple disk;* wet-d, *wet disk or disk-in-oil;* wet-p, *wet plate or plate-in-oil;* r-cone, *reversed cone or inverted cone;* cont-b, *contracting band;* exp-s, *expanding shoe.* **Gearset Type,** prog, *progressive sliding gear;* selec, *selective sliding gear;* plan, *planetary;* ind-c, *constant-mesh, individual-clutch;* fric, *friction;* elec, *electric.* **Gearset Location,** amid, *amidships;* unit-m, *unit with motor;* unit-j, *unit with jackshaft;* unit-x, *unit with axle.* **Gearset Speeds,** inf, *infinite number.* **Final Drive,** int-g, int-gear, *internal-gear;* sing chn, *single chain;* dbl chn, *double chain;* doub-red, *double reduction;* spur-g, *spur gears;* sp-bev, *spiral bevel;* f, *front wheel or wheels;* 4, *four-wheel driven.* **Torque Taken By,** rad-rd, *radius rods;* tor-arm, *torque arm;* tor-t, *torsion tube;* sub-f, *sub-frame.* **Propulsion Taken By,** rad-rd, *radius rod;* tor-t, *torsion tube;* tor-arm, *torque arm;* sub-f, *sub-frame.* **Springs,** ellip, *elliptic;* ½-ell, *half elliptic;* ¼-ell, *quarter elliptic;* ¾-ell, *three-quarters elliptic;* plat, *platform;* cant, *cantilever.* **Control Levers,** cent, *center;* c & r, *gearshift center, brake right;* c & l, *gearshift center, brake left.*

Technical Specifications of Gasoline

Name and Model	Capacity in Pounds	Price of Chassis	Wheelbase in Inches	TIRES			MOTOR												
				Kind	SIZES IN INCHES		Location	No. of Cylinders	No. of Crankshaft Bearings	Bore and Stroke	N.A.C.C. Hp.	Cylinders Cast	Valves Placed	COOLING		IGNITION		
					Front	Rear								Water Circulation	Radiator Core and Case	Type	Make	Spark Advance
Couple-Gear.....HC	7,000	4,800	144	solid	36x4d	36x4d	under flr	4	5	5½x6	53.00	sing	opp	gear	cell-sheet	dual	Mea	fixed
Couple-Gear.....AC	10,000	5,200	144	solid	36x5d	36x5d	under flr	4	5	5½x6	53.00	sing	opp	gear	cell-sheet	dual	Mea	fixed
Croco.....16	1,000	800	104	pneu	32x4	32x4	under hood	4	2	3½x5	16.92	block	right	cent	sq-t-sheet	sing	Bosch	hand
Croco	3,000	1,900	120*	solid	36x4	36x4	btw seats	4	3	4 x5	25.60	block	right	cent	sq-t-cast	sing	Bosch	hand
Croco	5,000	2,600	130	solid	36x5	36x6	btw seats	4	3	4 x5	25.60	block	right	cent	sq-t-cast	sing	Bosch	hand
Crowther.....10-30	1,000	600	110	pneu	32x3½	33x4	under hood	4	3	3½x4½	22.50	block	right	thermo	fin-sheet	sing	Dixie	hand
Dart.....BB	1,500	1,300	124	solid	36x3	36x4	under hood	4	3	3½x5½	19.61	block	right	thermo	cell-sheet	sing	Eisemann	fixed
Dart.....B	2,000	1,400	138*	solid	36x3	36x3½	under hood	4	3	3½x5½	19.61	block	right	thermo	cell-sheet	sing	Eisemann	fixed
Dart.....C	4,000	1,900	144*	solid	34x4	38x3½d	under hood	4	3	4½x5½	27.20	block	right	cent	cell-sheet	sing	Eisemann	fixed
Dart.....CC	5,000	2,100	150	solid	36x4	36x4d	under hood	4	3	4½x5½	27.20	block	right	cent	cell-sheet	sing	Eisemann	fixed
Dayton.....U	4,000	2,650	118½	solid	36x4	36x3½d	under seats	4	3	4½x5	29.00	pairs	opp	cent	fin-cast	dual	Bosch	hand
Dayton.....A	7,000	3,400	136	solid	36x5	36x4d	under seats	4	3	4½x5½	36.15	pairs	opp	cent	fin-cast	dual	Bosch	hand
Dayton.....B	10,000	4,500	148	solid	36x6	42x5d	under seats	4	3	5½x7	44.20	pairs	opp	cent	fin-cast	dual	Bosch	hand
Dayton.....E	15,000	4,950	148	solid	36x7	42x6d	under seats	4	3	5½x7	44.20	pairs	opp	cent	fin-cast	dual	Bosch	hand
DeKalb.....D1	3,000	1,950	134*	solid	34x3½	36x5	under hood	4	3	4½x5½	27.20	block	left	cent	fin-sheet	sing	Eisemann	hand
DeKalb.....D2	5,000	2,450	136*	solid	36x4	36x6	under hood	4	3	4½x5½	27.20	block	left	cent	fin-sheet	sing	Eisemann	fixed
Denby.....U	1,500	890-c	119	solid	34x3	34x3½	under hood	4	2	3½x4½	15.64	block	right	thermo	sq-t-sheet	sing	Dixie	fixed
Denby.....B	2,000	1,475	120	solid	34x3½	34x5	under hood	4	3	3½x5	19.61	block	right	thermo	sq-t-cast	sing	Eisemann	fixed
Denby.....D	3,000	1,685	144*	solid	36x3½	36x5	under hood	4	3	3½x5	22.50	block	right	thermo	sq-t-cast	sing	Eisemann	fixed
Denby.....E	4,000	1,985	144*	solid	36x4	36x6	under hood	4	3	3½x5	22.50	block	right	thermo	sq-t-cast	sing	Eisemann	fixed
Detroit.....B	1,000	.....	112	pneu	32x3½	32x3½	under hood	4	3	3½x4½	22.50	block	left	thermo	cell-sheet	sing	Dixie	hand
Diamond-T.....JA-JB	1,500	1,175	126*	solid	36x3	36x3½*	under hood	4	3	3½x5	19.61	block	right	thermo	fin-sheet	sing	Bosch	fixed
Diamond-T.....J2	3,000	2,050	160*	solid	36x3½	36x5	under hood	4	3	4½x5½	27.20	block	left	cent	sq-t-sheet	sing	Bosch	fixed
Diamond-T.....J3	4,000	2,200	160*	solid	36x4	36x6	under hood					block	left	cent	sq-t-sheet	sing	Bosch	fixed
Diamond-T.....L	7,000	3,300	164*	solid	36x5	38x5d	under hood	4	3	4½x5½	32.40	pairs	left	cent	sq-t-sheet	sing	Bosch	hand
Dispatch.....L	1,200	900	120	pneu	36x3½	36x3½	under hood	4	3	3½x5	22.50	block	left	thermo	cell-sheet	sing	Bosch	hand
Doane	12,000	4,500-c	178	solid	36x6	38x6d	under hood	4	3	4½x6½	36.15	pairs	left	cent	fin-cast	dual	Bosch	hand
Dorris.....IA4	1,500	1,900	144*	pneu	36x4½	36x4½	under hood	4	3	4½x5	30.65	pairs	head	cent	cell-sheet	dual	Westinghouse	auto-h
Dorris.....IAW	4,000	2,500	162*	solid	36x4	36x4d	under hood	4	3	4½x5	30.65	pairs	head	cent	cell-cast	dual	Bosch	hand
Duplex.....C	4,000	2,800	130*	solid	36x4	36x4	under hood	4	3	4½x5½	27.20	block	right	cent	fin-sheet	sing	Bosch*	
Duplex.....E	4,000	.....	130*	solid	36x6	36x6	under hood	4	3	4½x5	29.00	block	right	cent	fin-sheet	dual	Bosch*	hand
Duplex.....D	6,000	3,300	130*	solid	36x5	36x5	under hood	4	3	4½x5½	29.00	block	right	cent	fin-sheet	sing	Bosch*	
Duryea	1,000	600	84	solid	38x1¾	42x1¾	under body	2	4	3½x3½	.....	sing	2-cyc	air	none	sing	Bosch	hand
Dominion.....Tractor	12,000	3,200	90	solid	36x4	36x4d	btw seats	4	3	4½x5½	36.15	pairs	opp	cent	fin-cast	sing	Connecticut	hand
Falcon.....A	1,000	715	106	pneu	31x4	31x4	under hood	4	.....	3 x4	14.40	block	head	thermo	cell-sheet	sing	.....	auto
Fargo.....K	2,000	1,175	130	solid	36x3	36x4	under hood	4	3	3½x5	22.50	block	left	thermo	fin-sheet	sing	Bosch	hand
Fargo.....N	4,000	1,575	156	solid	36x4	36x6	under hood	4	3	4½x5½	27.20	block	left	cent	fin-sheet	dual	Bosch	hand
Federal.....M	3,000	1,800	144*	solid	36x3½	36x5	under hood	4	3	4½x5½	27.20	block	left	cent	cell-cast	sing	Eisemann	fixed
Federal.....L	7,000	2,800	146	solid	36x5	36x5d	under hood	4	3	4½x5½	32.40	pairs	left	cent	cell-cast	sing	Eisemann	fixed
F.W.D.....G	3,000	3,600	124	solid	36x4	36x4	under seats	4	3	4½x5	32.40	pairs	opp	cent	sq-t-sheet	sing	Bosch	hand
F.W.D.....B	6,000	4,000	124	solid	36x6	36x6	under seats	4	3	4½x5½	36.15	pairs	opp	cent	sq-t-sheet	sing	Eisemann	hand
F.W.D.....M	10,000	4,800	148	solid	38x5d	38x5d	under seats	4	3	5½x7	44.20	pairs	opp	cent	cell-sheet	dual	Bosch	hand
Gabriel.....H	1,500	1,600	126	pneu	34x4½	34x4½	under hood	4	3	4½x5½	27.20	block	left	cent	s-s-t-sheet	sing	Bosch	hand
Gabriel.....O	2,000	1,800	136	pneu	36x5	36x5	under hood	4	3	4½x5½	27.20	block	left	cent	s-s-t-sheet	sing	Bosch	hand
Gabriel.....M	3,000	2,200	144	pneu	36x5	36x5d	under hood	4	3	4½x5½	27.20	block	left	cent	s-s-t-sheet	sing	Bosch	hand
Garford.....64	1,500	1,350	120	p & s	34x4½	36x3½	under hood	4	3	3½x5½	19.61	block	right	thermo	cell-sheet	sing	Dixie	hand
Garford.....75	2,000	1,450	120	p & s	34x4½	36x4	under hood	4	3	3½x5½	19.61	block	right	thermo	cell-sheet	sing	Dixie	hand
Garford.....66	3,000	1,800	142*	solid	36x3½	36x5	under hood	4	3	3½x5½	22.50	block	right	cent	cell-sheet	sing	Dixie	hand
Garford.....70	4,000	2,300	142*	solid	36x4	36x4d	under hood	4	3	4½x5½	29.00	block	right	cent	cell-sheet	sing	Dixie	hand
Garford.....D	10,000	4,300	128*	solid	36x6	40x6d	btw seats	4	3	4½x5½	36.15	pairs	opp	cent	cell-sheet	sing	Dixie	hand
Garford.....F	12,000	4,500	128*	solid	36x6	40x7d	btw seats	4	3	5 1/10x5½	41.61	pairs	opp	cent	cell-sheet	sing	Dixie	hand
G. A. Schacht	4,000	2,800	138*	solid	38x3½	40x3½d	under hood	4	3	4½x5½	29.00	block	r & h	cent	cell-sheet	sing	Eisemann	hand
G. A. Schacht	6,000	3,200	168*	solid	38x4	38x5d	under hood	4	3	4½x5½	29.00	block	r & h	cent	cell-sheet	sing	Eisemann	hand
Geraix.....C	5,000	2,500	148*	solid	36x4	36x7	under hood	6	4	3½x5½	33.75	block	left	cent	sq-t-cast	sing	battery	fixed
G.M.C.....15	1,500	1,090	122	pneu	35x5	35x5	under hood	4	3	3½x5	19.61	block	right	cent	fin-sheet	sing	Eisemann	hand
G.M.C.....25	2,500	1,800	144*	solid	36x3½	36x5	under hood	4	3	3½x5	22.50	block	right	cent	fin-cast	sing	Eisemann	hand
G.M.C.....26	2,500	1,800	144*	solid	36x3½	36x5	under hood	4	3	3½x5	22.50	block	right	cent	fin-cast	sing	Eisemann	hand
G.M.C.....31	3,000	1,900	144*	solid	36x3½	36x5	under hood	4	3	3½x5	22.50	block	right	cent	fin-cast	sing	Eisemann	hand
G.M.C.....40	4,000	2,375	158*	solid	36x4	36x4d	under hood	4	3	4½x5½	27.20	block	right	cent	fin-cast	sing	Eisemann	hand
G.M.C.....41	4,000	2,375	158*	solid	36x4	36x4d	under hood	4	3	4½x5½	27.20	block	right	cent	fin-cast	sing	Eisemann	hand
G.M.C.....70	7,000	3,175	163*	solid	36x5	40x5d	under hood	4	3	4½x5½	32.40	pairs	left	cent	fin-cast	sing	Eisemann	hand
G.M.C.....71	7,000	3,175	163*	solid	36x5	40x5d	under hood	4	3	4½x5½	32.40	pairs	left	cent	fin-cast	sing	Eisemann	hand
G.M.C.....100	10,000	.....	163*	solid	36x6	40x6d	under hood	4	3	4½x5½	32.40	pairs	left	cent	fin-cast	sing	Eisemann	hand
G.M.C.....101	10,000	.....	163*	solid	36x6	40x6d	under hood	4	3	4½x5½	32.40	pairs	left	cent	fin-cast	sing	Eisemann	hand
Geneva.....1	1,500	.....	96	solid	34x2	36x2½	under hood	2	2	5½x4½	22.10	sing	head	gear	fin-sheet	sing	Simms	fixed
Gramm-Bernstein	2,000	1,500	118	solid	34x3	34x4	under hood	4	3	3½x5½	19.61	block	right	thermo	fin-cast	sing	Bosch	hand
Gramm-Bernstein	3,000	1,800	130*	solid	34x3½	36x5	under hood	4	3	3½x5½	19.61	block	right	thermo	fin-cast	sing	Bosch	hand
Gramm-Bernstein	5,000	2,600	156	solid	36x4	36x4d	under hood	4	3	4½x5½	29.00	pairs	left	cent	fin-cast	dual	Bosch	hand
Gramm-Bernstein	7,000	3,400	168	solid	36x5	40x5d	under hood	4	3	4½x5½	29.00	pairs	left	cent	fin-cast	dual	Bosch	hand
Gramm-Bernstein	12,000	4,300	168*	solid	36x6	40x6d	under hood	4	3	4½x6½	32.40	pairs	left	cent	fin-cast	dual	Bosch	hand

ABBREVIATIONS: General, *, *with other options;* opt, *optional.* **Price,** -c, *complete with body.* **Tires, Kind,** Pneu, *pneumatic;* Cush, *cushion;* p & s, *pneumatic in front and solid in rear;* s & st, *solid in front and steel in rear.* **Tire Sizes,** d, *dual.* **Motor Location,** btw seats, *between seats;* under flr, *under floor.* **Cylinders Cast,** sing, *singly or individually.* **Location of Valves,** opp, *opposite or T-head type;* top (two-cylinder motors only), *L-head cylinder laid horizontal with valves up;* r & h, *at right and in head, L-head cylinder;* l & h, *at left and in head, L-head cylinder;* 2-cyc, *two-cycle motor, no valves.* **Water Circulation,** cent, *centrifugal pump;* gear, *gear pump;* thermo, *thermo-syphon circulation;* air, *air-cooled, no water.* **Radiator Type and Case,** fin-sheet, *finned-tube core with sheet metal casing;* fin-cast, *finned-tube core with cast aluminum casing;* sq-t-sheet, *square tube or flat tube core with sheet metal casing;* sq-t-cast, *square tube core with cast aluminum casing;* cell-sheet, *cellular or honeycomb core with sheet metal casing;* cell-cast, *cellular core with cast aluminum casing;* s-s-t-sheet, *zig-zag tube core with sheet metal casing;* s-s-t-cast, *zig-zag tube core with cast aluminum casing;* ring-cast, *copper tube core arranged in a ring about a centrifugal fan with a cast aluminum casing.* **Ignition Type,** sing, *single;* doub, *double.* **Make of Magneto** (or other sparking device), Atw. Kent, *Atwater Kent.* **Spark Advance,** auto, *automatic;* auto-h, *automatic advance with hand adjustment;* 2-pt, *two-point fixed, battery circuit fixed in retard, magneto in advance.*

Commercial Vehicles for 1916—Continued

MOTOR						TRANSMISSION								SPRINGS		CONTROL		
GOVERNOR		SPEED					GEARSET											
Type	Drive	Motor in r.p.m.	Truck in m.p.h.	Carbureter Make	Lubrication	Clutch Type	Type	Location	Speeds	Total Gear Reduction in High	Final Drive	Torque Taken By	Propulsion Taken By	Front	Rear	Steer	Levers	Name and Model
none	none	.....	15	Stromberg	spl-press.	none	elec	unit-m	1	25.00 –1	bevel-4	springs	rad-rd	½-ell.	½-ell.	right	.....	Couple-Gear HC
none	none	.....	12	Stromberg	spl-press.	none	elec	unit-m	1	25.00 –1	bevel-4	tor-arm	rad-rd	½-ell.	½-ell.	right	.....	Couple-Gear AC
none	none	1,000	25	Rayfield	circ-spl	dry-d	selec	unit-m	3	.....	bevel	springs	springs	½-ell.	½-ell.	left	cent.	Croce 16
none	none	1,000	15	Rayfield	spl-press.	cone	selec	amid	3	.....	top worm	springs	springs	½-ell.	½-ell.	right	right	Croce
none	none	1,000	15	Rayfield	spl-press.	cone	selec	amid	3	.....	top worm	springs	springs	½-ell.	½-ell.	right	right	Croce
none	none	3,000	35	Mayer	pressure	none	rollers	unit-j	3	.....	rollers	tor-t	sub-f	½-ell.	¾-ell.	left	cent	Crowther 10-30
none	none	.....	20	Stromberg	spl-press.	dry-d	prog	unit-m	3	5.80 –1	top worm	springs	springs	½-ell.	½-ell.	left	cent	Dart BB
.....	.....	.....	22	Stromberg	spl-press.	dry-d	selec	unit-m	3	8.25 –1	dbl chn	.....	rad-rd	½-ell.	½-ell.	left	cent	Dart B
.....	.....	1,500	20	Stromberg	spl-press.	cone	selec	unit-j	3	8.25 –1	dbl chn	.....	rad-rd	½-ell.	½-ell.	left	cent	Dart C
cent	duplex	1,500	17	Stromberg	spl-press.	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell.	½-ell.	left	cent	Dart CC
cent	duplex	1,000	13½	Stromberg*	circ-spl	wet-d	selec	unit-j	3	9.16 –1	dbl chn	.....	rad-rd	½-ell.	plat	left	cent	Dayton U
cent	duplex	1,000	11	Stromberg*	circ-spl	wet-d	selec	unit-j	3	9.40 –1	dbl chn	.....	rad-rd	½-ell.	plat	left	cent	Dayton A
cent	duplex	1,000	10	Stromberg*	circ-spl	wet-d	selec	unit-j	4	12.00 –1	dbl chn	.....	rad-rd	½-ell.	plat	left	cent	Dayton B
cent	duplex	1,000	10	Stromberg*	circ-spl	wet-d	selec	unit-j	4	12.00 –1	dbl chn	.....	rad-rd	½-ell.	plat	left	cent	Dayton E
cent	motor	1,162	18	Stromberg	spl-press.	dry-d*	selec	amid*	3	6.83 –1	top worm*	springs	springs*	½-ell.	½-ell.	left	cent	DeKalb D1
cent	motor	1,100	14	Stromberg	spl-press.	dry-d*	selec	amid*	3	8.25 –1	top worm*	springs	springs*	½-ell.	½-ell.	left	cent	DeKalb D2
cent	motor	1,600	20	Denby	circ-spl	dry-p	selec	unit-m	3	8.20 –1	int-gear	springs	springs	½-ell.	½-ell.	left	cent	Denby U
cent	motor	1,375	18	Stromberg	circ-spl	dry-p	selec	unit-m	3	7.40 –1	int-gear	springs	springs	½-ell.	½-ell.	c & l	.....	Denby B
cent	motor	1,327	15	Stromberg	circ-spl	dry-p	selec	unit-m	3	9.46 –1	int-gear	springs	springs	½-ell.	½-ell.	left	cent	Denby D
cent	motor	1,327	14	Stromberg	circ-spl	dry-p	selec	unit-m	3	9.46 –1	int-gear	springs	springs	½-ell.	½-ell.	left	cent	Denby E
none	none	2,800	58	opt	circ-spl	wet-d	selec	unit-m	3	4.25 –1	bevel	tor-arm	springs	½-ell.	cant	left	cent	Detroit B
none	none	1,500	23	Rayfield	circ-spl	dry-d	selec	unit-m	3	7.00 –1*	top worm	springs	springs	½-ell.	½-ell.	left	.....	Diamond-T JA-JB
cent	motor	1,200	14	Rayfield	circ-spl	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell.	½-ell.	right	.....	Diamond-T J2
cent	motor	1,200	14	.....	circ-spl	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell.	½-ell.	right	.....	Diamond-T J3
cent	motor	.....	.....	Rayfield	circ-spl	dry-d	selec	unit-m	4	8.75 –1	top worm	springs	rad-rd	½-ell.	½-ell.	right	.....	Diamond-T L
suct	motor	1,500	25	Rayfield	pressure	none	fric	unit-j	4	3.12 –1	dbl chn	.....	rad-rd	ellip	ellip	right	right	Dispatch L
.....	.....	1,000	10	Schebler	circ-spl	dry-d	selec	unit-m	3	10.50 –1	dbl chn	.....	rad-rd	½-ell.	½-ell.	right	cent	Doane
none	none	1,143	30	Stromberg	circ-spl	dry-d	selec	unit-m	3	4.08 –1	bevel	tor-arm	springs	½-ell.	plat	left	cent	Dorris IA4
cent	motor	1,085	15	Stromberg	circ-spl	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell.	½-ell.	left	cent	Dorris IAW
cent	duplex	1,500	20	Schebler	circ-spl	dry-d	selec	unit-m	4	8.00 –1	int-g-4	tor-arm	rad-rd	½-ell.	½-ell.	left	cent	Duplex C
cent	duplex	1,240	12	Schebler	circ-spl	dry-d	selec	unit-m	8	8.00 –1	int-g-4	tor-arm	rad-rd	½-ell.	½-ell.	left	cent	Duplex E
cent	duplex	1,250	10	Schebler	circ-spl	dry-d	selec	unit-m	4	8.00 –1	int-g-4	tor-arm	rad-rd	½-ell.	½-ell.	left	cent	Duplex D
none	none	3,000	30	Kingston	fuel-inj	none	rollers	unit-m	2	10.00 –1	rollers	sub-f	sub-f	½-ell.	½-ell.	left	cent	Duryea
suct	motor	1,000	9	Schebler	pressure	dry-d	selec	unit-m	3	.....	top worm	springs	springs	½-ell.	½-ell.	left	c & l	Dominion Tractor
none	none	2,600	30	Zenith	circ-spl	cone	selec	unit-m	3	5.00 –1	bevel	.....	rad-rd	½-ell.	plat	left	cent	Falcon A
none	none	1,100	18	Rayfield	spl-press.	dry-d	selec	unit-m	3	6.50 –1	int-gear	springs	springs	½-ell.	½-ell.	left	cent	Fargo K
none	none	1,100	15½	Rayfield	spl-press.	dry-d	prog	unit-m	3	7.75 –1	int-gear	springs	springs	½-ell.	½-ell.	left	cent	Fargo N
cent	motor	1,190	15	Stromberg	circ-spl	cone	selec	amid	3	8.50 –1	top worm	springs	rad-rd	½-ell.	½-ell.	left	cent	Federal M
cent	motor	1,160	12	Stromberg	circ-spl	dry-d	selec	unit-m	3	10.33 –1	top worm	springs	rad-rd	½-ell.	½-ell.	right	cent	Federal L
l-b	motor	1,000	16	Stromberg	pressure	wet-d	ind-e	amid	3	9.75 –1	bevel-4	springs	springs	½-ell.	plat	right	right	F.W.D G
l-b	motor	1,100	13	Stromberg	spl-press.	wet-d	selec	amid	3	9.00 –1	bevel-4	springs	springs	½-ell.	plat	right	right	F.W.D B
l-b	motor	1,000	9½	Stromberg	pressure	wet-d	selec	amid	3	12.00 –1	bevel-4	springs	springs	½-ell.	plat	right	right	F.W.D M
none	none	1,200	28	Rayfield	circ-spl	cone	selec	amid	3	4.25 –1	bevel	tor-arm	springs	½-ell.	½-ell.	left	cent	Gabriel H
none	none	1,200	21	Rayfield	circ-spl	cone	selec	amid	4	5.50 –1	top worm	springs	springs	½-ell.	½-ell.	left	cent	Gabriel O
none	none	1,200	16½	Rayfield	circ-spl	cone	selec	amid	4	7.25 –1	top worm	springs	springs	½-ell.	½-ell.	left	cent	Gabriel M
suct	motor	1,150	18¾	Rayfield	circ-spl	dry-d	selec	unit-j	3	6.62 –1	dbl chn	.....	rad-rd	½-ell.	½-ell.	right	cent	Garford 64
suct	motor	1,000	17	Rayfield	circ-spl	dry-d	selec	unit-m	3	6.50 –1	top worm	springs	springs	½-ell.	½-ell.	right	cent	Garford 75
suct	motor	1,000	13¾	Rayfield	circ-spl	dry-d	selec	amid	3	7.75 –1	top worm	springs	springs	½-ell.	½-ell.	right	.....	Garford 66
suct	motor	1,000	13¾	Rayfield	circ-spl	dry-d	selec	amid	3	7.75 –1	top worm	springs	springs	½-ell.	½-ell.	right	.....	Garford 70
suct	motor	1,000	8	Rayfield	pressure	wet-d	selec	unit-j	4	13.31–1	dbl chn	.....	rad-rd	½-ell.	½-ell.	right	right	Garford D
.....	.....	1,000	8	Rayfield	pressure	dry-d	selec	unit-j	4	13.31–1	dbl chn	.....	rad-rd	½-ell.	½-ell.	right	right	Garford F
l-b	motor	1,000	15	Schebler	spl-press.	cone	selec	amid	3	7.75 –1	top worm	tor-arm	rad-rd	½-ell.	plat	left	.....	G. A. Schacht
l-b	motor	1,000	15	Schebler	spl-press.	cone	selec	amid	3	9.66 –1	top worm	tor-t	rad-rd	½-ell.	plat	left	.....	G. A. Schacht
.....	.....	1,150	14	Stromberg	spl-press.	dry-d	selec	unit-m	4	8.66 –1	top worm	springs	springs	½-ell.	½-ell.	left	.....	Gersix C
suct	motor	1,150	20	Marvel	circ-spl	cone	selec	amid	3	6.00 –1	bevel	tor-t	tor-t	½-ell.	ellip	left	cent	G.M.C 15
suct	motor	1,300	16	Marvel	circ-spl	dry-d	selec	unit-m	4	8.66 –1	dbl chn	.....	rad-rd	½-ell.	½ ell.	left	cent	G.M.C 25
suct	motor	1,300	16	Marvel	circ-spl	dry-d	selec	unit-m	4	8.75 –1	top worm	springs	rad-rd	½-ell.	½-ell.	left	cent	G.M.C 26
suct	motor	1,300	15	Marvel	circ-spl	dry-d	selec	unit-m	4	9.25 –1	top worm	springs	rad-rd	½-ell.	½-ell.	left	cent	G.M.C 31
suct	motor	1,200	14	Marvel	spl-press.	dry-d	selec	unit-m	4	9.06 –1	dbl chn	.....	rad-rd	½-ell.	½-ell.	left	cent	G.M.C 40
suct	motor	1,200	14	Marvel	spl-press.	dry-d	selec	unit-m	4	9.25 –1	top worm	springs	rad-rd	½-ell.	½-ell.	left	cent	G.M.C 41
suct	motor	1,100	12	Marvel	spl-press.	dry-d	selec	amid	4	10.90 –1	dbl chn	.....	rad-rd	½-ell.	½-ell.	left	cent	G.M.C 70
suct	motor	1,210	12	Marvel	spl-press.	dry-d	selec	amid	4	12.00 –1	top worm	springs	rad-rd	½-ell.	½-ell.	left	cent	G.M.C 71
suct	motor	1,160	9¾	Marvel	spl-press.	dry-d	selec	amid	4	13.84 –1	dbl chn	.....	rad-rd	½-ell.	½-ell.	left	cent	G.M.C 100
suct	motor	1,150	10	Marvel	spl-press.	dry-d	selec	amid	4	13.66 –1	top worm	.....	rad-rd	½-ell.	½-ell.	left	cent	G.M.C 101
.....	.....	.....	18	Schebler	spl-press.	dry-p	plan	unit-j	2	.....	dbl chn	.....	rad-rd	½-ell.	ellip	right	right	Geneva 1
cent	motor	1,100	20	Zenith	circ-spl	dry-d	ind-c	amid	3	6.50 –1	top worm	springs	springs	½-ell.	½-ell.	left	.....	Gramm-Bernstein
cent	motor	1,100	17	Zenith	circ-spl	dry-d	ind-c	amid	3	7.75 –1	top worm	springs	springs	½-ell.	½-ell.	left	.....	Gramm-Bernstein
cent	motor	1,100	15	Zenith	circ-spl	dry-d	ind-c	amid	3	8.60 –1	top worm	springs	springs	½-ell.	½-ell.	left	.....	Gramm-Bernstein
cent	motor	1,100	12	Zenith	circ-spl	dry-d	ind-c	amid	4	11.75 –1	top worm	springs	springs	½-ell.	½-ell.	left	.....	Gramm-Bernstein
cent	motor	1,100	10	Zenith	circ-spl	dry-d	ind-c	amid	4	13.00 –1	top worm	springs	springs	½-ell.	½-ell.	left	.....	Gramm-Bernstein

ABBREVIATIONS: (continued). **Governor Type,** cent, *centrifugal;* l-b, *loose-ball;* suct, *suction;* hyd, *hydraulic;* elec, *electric.* **Governor Drive,** motor, *from motor;* d-shaft, *from driving shaft;* f-wheel, *from front wheel;* duplex, *from both the motor and driving shaft by overrunning clutches.* **Lubrication,** splash, *non-circulating or simple splash;* circ-spl, *circulating splash;* spl-press, *splash-pressure;* fuel-inj, *fuel injection, oil mixed with fuel;* pressure, *pressure feed, no splash.* **Clutch Type,** dry-p, *dry plate;* dry-d, *dry multiple disk;* wet-d, *wet disk or disk-in-oil;* wet-p, *wet plate or plate-in-oil;* r-cone, *reversed cone or inverted cone;* cont-b, *contracting band;* exp-e, *expanding shoe.* **Gearset Type,** prog, *progressive sliding gear;* selec, *selective sliding gear;* plan, *planetary;* ind-c, *constant-mesh, individual-clutch;* fric, *friction;* elec, *electric.* **Gearset Location,** amid, *amidships;* unit-m, *unit with motor;* unit-j, *unit with jackshaft;* unit-x, *unit with axle.* **Gearset Speeds,** inf, *infinite number.* **Final Drive,** int-g, int-gear, *internal-gear;* sing chn, *single chain;* dbl chn, *double chain;* doub-red, *double reduction;* spur-g, *spur gears;* sp-bev, *spiral bevel;* f, *front wheel or wheels;* 4, *four-wheel driven.* **Torque Taken By,** rad-rd, *radius rods;* tor-arm, *torque arm;* tor-t, *torsion tube;* sub-f, *sub-frame.* **Springs,** ellip, *elliptic;* ½-ell, *half elliptic;* ¼-ell, *quarter elliptic;* ¾-ell, *three-quarter elliptic;* plat, *platform;* cant, *cantilever.* **Control Levers** cent, *center* c & r, *gearshift center brake right;* c & l, *gearshift center, brake left.*

Technical Specifications of Gasoline

Name and Model	Capacity in Pounds	Price of Chassis	Wheelbase in Inches	TIRES			MOTOR												
				Kind	SIZES IN INCHES		Location	No. of Cylinders	No. of Crankshaft Bearings	Bore and Stroke	N.A.C.C. Hp.	Cylinders Cast	Valves Placed	COOLING		IGNITION		
					Front	Rear								Water Circulation	Radiator Core and Case	Type	Make	Spark Advance
G.V. Mercedes....FV	12,000	.....	169	solid....	34x5	40x6	under hood..	4	4	4½x5⅝	29.00	pairs...	head...	cent....	cell-sheet...	sing....	Bosch.....	fixed...
Hall.....	7,000	2,800	144*	solid....	36x5	36x5d	under hood..	4	5	4½x5½	32.40	pairs...	left....	cent....	fin-cast.....	sing....	Bosch*.....	auto...
Hall.....	7,000	2,800	144*	solid....	36x5	40x5d	under hood..	4	5	4½x5½	32.40	pairs...	left....	cent....	fin-cast.....	sing....	Bosch*.....	auto...
Hall.....	10,000	3,400	144*	solid....	36x5	40x6d	under hood..	4	5	4½x5½	32.40	pairs...	left....	cent....	fin-cast.....	sing....	Bosch*.....	auto...
Hanger.....B	1,000	875	110*	pneu....	32x4	32x4	under hood..	4	2	3½x5	16.92	block...	left....	thermo..	cell-sheet...	sing....	K.-W.....	hand...
Harvey.....WH	7,000	2,700	168*	solid....	36x5	36x5d	under hood..	4	3	4½x5½	29.00	block...	right...	cent....	sq-t-sheet...	sing....	Eisemann....	auto...
Harvey.....WK	10,000	3,400	168*	solid....	36x5	40x6d	under hood..	4	3	4½x6	32.40	block...	right...	cent....	sq-t-sheet...	dual...	Eisemann....	auto...
Henderson.....C	1,200	1,100	106*	pneu....	34x4	34x4	under hood..	4	3	3½x5	19.61	block..	left....	thermo..	fin-sheet....	sing....	Bosch.....	fixed...
Henderson.....D	2,000	1,500	124*	pneu*...	35x5*	35x5*	under hood..	4	3	3½x5	22.50	block...	right...	thermo..	fin-sheet....	sing....	Bosch.....	fixed...
Headley.....	4,000	3,000	145	solid....	36x4	36x4	under hood..	4	.....	4½x5½	27.20	block...	left....	cent....	fin-sheet....	dual...	Remy.....	hand...
Horner.....F-G	3,000	.....	145*	solid....	36x4	36x5	under hood..	4	3	4½x5½	27.20	block...	left....	cent....	fin-cast.....	dual...	Bosch.....	hand...
Horner.....F-G	4,000	.....	145*	solid....	36x4	36x5	under hood..	4	3	4½x5½	27.20	block...	left....	cent....	fin-cast.....	dual...	Bosch.....	hand...
Horner.....F-G	6,000	.....	145*	solid....	36x5	40x4d	under hood..	4	3	4½x5½	32.40	pairs...	left....	cent....	fin-cast.....	dual...	Bosch.....	hand...
Horner.....F	10,000	.....	156*	solid....	38x6	42x6d	under hood..	4	3	5½x5½	44.20	pairs...	opp....	cent....	fin-cast.....	dual...	Bosch.....	hand...
Hannibal.....A	1,000	550	106	pneu....	30x3½	30x3½	under hood..	4	.....	3½x4½	16.92	block...	.....	thermo..	cell-sheet...	sing....	Atw. Kent....	.....
I.H.C.....MA	1,000	600-c	90	solid*...	42x2*	42x2*	under body..	2	2	5 x5	20.00	sing....	head...	air.....	none.....	dual...	Heinze.....	hand...
I.H.C.....MW	1,000	710-c	90	solid*...	36x2*	36x2*	under body..	2	2	4½x5	16.20	sing....	top....	cent....	fin-sheet....	dual...	Heinze.....	hand...
I.H.C.....E	1,500	950-c	102	solid*...	40x2½*	40x3*	under body..	2	2	4½x5	16.20	sing....	top....	cent....	fin-sheet....	sing....	Bosch.....	hand...
I.H.C.....F	2,000	1,500	128	solid*...	37x3½*	37x4*	under hood..	4	3	3½x5½	19.61	block...	right...	cent....	fin-sheet....	sing....	Bosch.....	hand...
Independent.....F	1,500	1,285	128*	solid*...	36x3*	36x3½*	under hood..	4	3	3½x5	19.61	block...	right...	thermo..	z-z-t-sheet..	sing....	Eisemann....	fixed...
Independent.....G	4,000	1,800	144	solid....	36x3½	36x5	under hood..	4	3	4½x5½	27.20	block..	right...	thermo..	cell-cast....	sing....	Eisemann....	fixed...
Indiana.....S	2,000	.....	128	solid*...	36x3½	36x4	under hood..	4	3	3½x5	19.61	block...	right...	cent....	fin-cast.....	sing....	Bosch.....	fixed...
Indiana.....D	3,000	.....	135	solid....	.....	.....	under hood..	4	3	4½x5½	27.20	pairs...	right...	cent....	fin-cast.....	sing....	Bosch.....	hand...
Indiana.....R	6,000	.....	156	solid....	36x5	36x5d	under hood..	4	3	4½x5½	27.20	pairs...	right...	cent....	fin-cast.....	sing....	Bosch.....	hand...
Indiana.....L	10,000	.....	163	solid....	.....	40x-d	under hood..	4	.....	4½x5½	36.15	pairs...	opp....	cent....	fin-cast.....	sing....	Bosch.....	hand...
Jeffery.....4015	4,000	2,750	124	solid....	36x5	36x5	btw seats...	4	3	3½x5½	22.50	block...	right...	cent....	cell-sheet...	dual...	Bosch.....	hand...
Kearns.....L	500	375	90	pneu....	28x3	28x3	under hood..	4	2	2½x4	12.08	block...	right...	thermo..	fin-sheet....	sing....	Atw. Kent....	auto...
Kearns.....D	1,000	600	107	pneu....	30x3½	30x3½	under hood..	4	2	3½x5	16.92	block...	right...	thermo..	fin-sheet....	sing....	Dixie.....	hand...
Kelly-Springfield...K-30	2,000	2,000	120	solid*...	36x3½*	36x5*	under hood..	4	3	3½x5½	22.50	block...	left....	cent....	cell-sheet...	sing....	Eisemann....	auto...
Kelly-Springfield...K-31	3,000	2,050	144*	solid....	36x3½	36x3d	under hood..	4	3	3½x5½	22.50	block...	left....	cent....	cell-sheet...	sing....	Eisemann....	auto...
Kelly-Springfield...K-35	4,000	2,750	144*	solid....	36x4	36x4d	under hood..	4	3	3½x5½	22.50	block...	left....	cent....	cell-sheet...	sing....	Eisemann....	auto...
Kelly-Springfield...K-40	6,000	3,400	150*	solid....	36x5	40x5d	under hood..	4	3	4½x6½	32.40	pairs...	opp....	gear....	cell-sheet...	sing....	Eisemann....	auto...
Kelly-Springfield...K-45	8,000	3,600	150*	solid....	36x5	40x5d	under hood..	4	3	4½x6½	32.40	pairs...	opp....	cent....	cell-sheet...	sing....	Eisemann....	auto...
Kelly-Springfield...K-50	10,000	4,250	150*	solid....	36x6	40x6d	under hood..	4	3	4½x6½	32.40	pairs...	opp....	cent....	cell-sheet...	sing....	Eisemann....	auto...
Kelly-Springfield...K-60	12,000	4,500	150*	solid....	36x6	40x7d	under hood..	4	3	4½x6½	32.40	pairs...	opp....	cent....	cell-sheet...	sing....	Eisemann....	auto...
King.....	7,000	2,600	120	solid....	36x5	36x5d	under fir....	4	3	4½x5½	32.40	pairs...	left....	cent....	z-z-t-sheet..	dual...	Bosch.....	2-pt....
Kissselkar.....	1,000	950	115	pneu....	32x4	32x4	under hood..	4	3	3½x5½	24.22	block...	right...	cent....	sq-t-sheet...	sing....	Eisemann....	hand...
Kisselkar.....	2,000	1,500	125	pneu*...	35x4½*	35x4½*	under hood..	4	3	3½x5½	24.22	block...	right...	cent....	sq-t-sheet...	sing....	Eisemann....	hand...
Kisselkar.....	4,000	2,100	144	solid....	34x3½	36x6	under hood..	4	3	4½x5½	29.00	block...	right...	cent....	sq-t-sheet...	sing....	Eisemann....	hand...
Kisselkar.....	6,000	2,750	144	solid....	36x4	38x4	under hood..	4	3	4½x5½	32.40	pairs...	left....	cent....	sq-t-sheet...	sing....	Eisemann....	hand...
Kisselkar.....	8,000	3,350	162	solid....	36x5	40x5d	under hood..	4	3	4½x5	38.25	pairs...	left....	cent....	sq-t-sheet...	sing....	Eisemann....	hand...
Kisselkar.....	12,000	4,350	168	solid....	36x6	40x6d	under hood..	4	3	4½x5	38.25	pairs...	left....	cent....	sq-t-sheet...	sing....	Eisemann....	hand...
Kleiber.....1	3,000	2,250	140*	solid....	36x3½	36x5	under hood..	4	3	4½x5½	27.20	block...	left....	cent....	z-z-t-sheet..	dual...	Bosch.....	hand...
Kleiber.....2	5,000	2,750	150*	solid....	36x4	36x4d	under hood..	4	3	4½x5½	27.20	block...	left....	cent....	z-z-t-sheet..	dual...	Bosch.....	hand...
Kleiber.....3	7,000	3,300	160*	solid....	36x5	36x5d	under hood..	4	3	4½x5½	32.40	pairs...	left....	cent....	z-z-t-sheet..	dual...	Bosch.....	hand...
Kleiber.....5	10,000	4,250	170*	solid....	36x6	40x6d	under hood..	4	3	5½x5½	44.20	pairs...	opp....	cent....	z-z-t-sheet..	dual...	Bosch.....	hand...
Knickerbocker.....16	4,000	2,200	148*	solid....	36x4	36x4d	under hood..	4	3	4½x5½	27.20	block...	left....	cent....	fin-cast.....	sing....	Bosch.....	hand...
Knickerbocker.....16	7,000	2,850	164*	solid....	36x5	36x5d	under hood..	4	3	4½x5	32.40	pairs...	left....	cent....	fin-cast.....	sing....	Bosch.....	hand...
Knox Tractor.....35	.....	4,500	108	solid....	36x4	38x6d	under hood..	4	3	5 x5½	40.00	pairs...	head...	cent....	sq-t-sheet...	sing....	Mea*.....	hand...
Koehler.....K	2,000	870	129	solid....	34x3	34x3½	under hood..	4	3	3½x5	19.61	block...	head...	thermo..	fin-cast.....	sing....	opt.....	hand...
Kosmath.....15	1,000	675	100	pneu....	32x3½	31x4	under hood..	4	2	3½x4½	15.65	block...	right...	thermo..	fin-sheet....	sing....	Atw. Kent*...	auto*..
Krebs.....F	1,500	1,600	120	pneu....	34x4½	34x4½	under hood..	4	5	3½x5	22.50	block...	right...	thermo..	fin-sheet....	sing....	Bosch.....	auto...
Krebs.....G	2,000	2,000	144*	solid....	34x3½	34x4	under hood..	4	5	3½x5½	22.50	block...	left....	cent....	fin-sheet....	sing....	Bosch.....	auto...
Krebs.....H	4,000	2,450	144*	solid....	36x4	36x6	under hood..	4	5	4½x5½	27.20	block...	left....	cent....	fin-sheet....	sing....	Bosch.....	auto...
Krebs.....I	6,000	3,100	162*	solid....	36x5	36x5d	under hood..	4	5	4½x5½	27.20	block...	left....	cent....	fin-sheet....	sing....	Bosch.....	auto...
Lambert.....V1	1,000	900	106*	pneu....	30x3½	31x4	under hood..	4	3	3½x4½	19.61	pairs...	left....	cent....	fin-sheet....	dual...	Bosch.....	hand...
Lambert.....V3	2,000	1,800	120	solid....	36x3½	36x4	under hood..	4	3	4½x5	32.40	block...	left....	cent....	fin-sheet....	dual...	.....	hand...
Lambert.....V5	4,000	2,000	120	solid....	36x4	36x5	under hood..	4	3	4½x5	32.40	block...	left....	cent....	fin-sheet....	dual...	.....	hand...
Landshaft.....GI	2,000	1,250	124*	solid....	34x3½	36x4	under hood..	4	3	3½x5½	19.61	block...	right...	thermo..	sq-t-sheet...	sing....	Swiss.....	hand...
Landshaft.....JI	4,000	1,550	144*	solid....	34x4	36x4	under hood..	4	3	4½x5½	27.20	block...	right...	cent....	sq-t-sheet...	sing....	Swiss.....	hand...
Lange.....C	2,000	1,750	130*	solid....	36x3½	38x4	under hood..	4	3	3½x5½	22.50	block...	left....	thermo..	cell-sheet...	sing....	Eisemann....	hand...
Lange.....B	4,000	2,350	136*	solid....	36x4	38x6	under hood..	4	3	4½x5½	27.20	block...	left....	thermo..	cell-sheet...	sing....	Eisemann....	hand...
Larrabee.....	3,000	1,950	132	solid....	36x3½	36x5	under hood..	4	3	4½x5½	27.20	block...	left....	cent....	fin-cast.....	sing....	Bosch.....	hand..
Larrabee.....	5,000	2,200	140*	solid....	36x4	36x6*	under hood..	4	3	4½x5½	27.20	block...	left....	cent....	fin-cast.....	sing....	Bosch.....	hand...
Lippard-Stewart.....M	1,000	1,000	106	pneu....	33x4	33x4	under hood..	4	2	3 x5	14.40	block...	right...	thermo..	fin-sheet....	sing....	Atw. Kent....	auto...
Lippard-Stewart.....W	1,500	1,600	125*	pneu*...	35x4½*	35x4½*	under hood..	4	3	3½x5½	22.50	block...	left....	cent....	fin-sheet....	sing....	Eisemann....	fixed...
Lippard-Stewart.....H	2,000	2,000	145	solid....	36x3	36x5	under hood..	4	3	3½x5½	22.50	block...	left....	cent....	z-z-t-cast...	sing....	Eisemann....	fixed...
Lippard-Stewart.....F	3,000	2,300	145	solid....	36x3½	36x3d	under hood..	4	3	4½x5½	27.20	block...	left....	cent....	z-z-t-cast...	sing....	Eisemann....	fixed...
Lippard-Stewart.....G	4,000	2,600	158	solid....	36x4	36x4d	under hood..	4	3	4½x5½	27.20	block...	left....	cent....	z-z-t-cast...	sing....	Eisemann....	fixed...

ABBREVIATIONS: General, *, *with other options;* opt, *optional.* **Price, -c,** *complete with body.* **Tires, Kind,** Pneu, *pneumatic;* Cush, *cushion;* p & s, *pneumatic in front and solid in rear;* s & st, *solid in front and steel in rear.* **Tire Sizes,** d, *dual.* **Motor Location,** btw seats, *between seats;* under fir, *under floor.* **Cylinders Cast,** sing, *singly or individually.* **Location of Valves,** opp, *opposite or T-head type;* top (two-cylinder motors only), *L-head cylinder laid horizontal with valves up;* r & h, *at right and in head, L-head cylinder;* l & h, *at left and in head, L-head cylinder;* 2-cyc, *two-cycle motor, no valves.* **Water Circulation,** cent, *centrifugal pump;* gear, *gear pump;* thermo, *thermo-syphon circulation;* air, *air-cooled, no water.* **Radiator Type and Case,** fin-sheet, *finned tube core with sheet metal casing;* fin-cast, *finned-tube core with cast aluminum casing;* sq-t-sheet, *square tube or flat tube core with sheet metal casing;* sq-t-cast, *square tube core with cast aluminum casing;* cell-sheet, *cellular or honeycomb core with sheet metal casing;* cell cast, *cellular core with cast aluminum casing;* z-z-t-sheet, *zig-zag tube core with sheet metal casing;* z-z-t-cast, *zig-zag tube core with cast aluminum casing;* ring-cast, *copper tube core arranged in a ring about a centrifugal fan with a cast aluminum casing.* **Ignition, Type,** sing, *single;* doub, *double.* **Make of Magneto** (or other sparking device), Atw. Kent, *Atwater Kent.* **Spark Advance,** auto, *automatic;* auto-h, *automatic advance with hand adjustment;* 2-pt, *two-point fixed, battery circuit fixed in retard, magneto in advance.*

Commercial Vehicles for 1916—Continued

MOTOR						TRANSMISSION								SPRINGS		CONTROL		
GOVERNOR		SPEED					GEARSET											
Type	Drive	Motor in r.p.m.	Truck in m.p.h.	Carburetor Make	Lubrication	Clutch Type	Type	Location	Speeds	Total Gear Reduction in High	Final Drive	Torque Taken By	Propulsion Taken By	Front	Rear	Steer	Levers	Name and Model
cent...	motor...	850	11	G.V.....	spl-press..	r-cone...	selec...	amid.....	4	9.36 –1	int-gear.....	tor-arm..	rad-rd....	½-ell...	½-ell...	right...	right...	G.V. Mercedes.....FV
suct...	motor...	1,150	15	Zenith.....	circ-spl...	dry-d...	prog...	unit-m....	4	.....	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left*...	cent...	Hall.....
suct...	motor...	1,150	15	Zenith.....	circ-spl...	dry-d...	prog...	unit-m....	4	.....	top worm....	springs...	springs...	½-ell...	½-ell...	left*...	cent...	Hall.....
suct...	motor...	1,150	12	Zenith.....	circ-spl...	dry-d...	prog...	unit-m....	4	.....	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left*...	cent...	Hall.....
none...	none....	1,600	25	Stromberg*..	circ-spl...	cone....	selec...	unit-m....	3	6.20 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Hanger.....B
cent...	duplex..	1,000	13	Holley.....	spl-press..	cone....	selec...	amid.....	4	8.75 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Harvey.....WH
cent...	duplex..	1,000	11	Holley.....	spl-press..	cone....	selec...	amid.....	4	11.75 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Harvey.....WK
none...	none....	2,000	32	Stromberg...	circ-spl...	dry-d...	selec...	unit-m....	3	6.25 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	.....	Henderson.....C
none...	none....	2,000	25	Stromberg...	circ-spl...	dry-d...	selec...	unit-m....	3	8.25 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	.....	Henderson.....D
none...	none....	1,000	12	Schebler.....	circ-spl...	wet-d...	selec...	unit-m....	3	4.80 –1	dbl chn-4....	sub-f.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Hoadley.....
cent...	motor...	1,200	16½	Stromberg...	spl-press..	dry-d...	selec...	amid.....	3	7.79 –1	top worm*...	springs...	rad-rd....	½-ell...	plat...	left....	cent...	Horner.....F-G
cent...	motor...	1,200	13½	Stromberg...	spl-press..	dry-d...	selec...	amid.....	3	9.43 –1	top worm*...	springs...	rad-rd....	½-ell...	plat...	left....	cent...	Horner.....F-G
cent...	motor...	1,100	14	Stromberg...	spl-press..	dry-d...	selec...	amid.....	3	9.40 –1	top worm*...	springs...	rad-rd....	½-ell...	plat...	left....	cent...	Horner.....F-G
cent...	motor...	1,000	9½	Stromberg...	spl-press..	dry-d...	selec...	amid.....	3	13.42 –1	dbl chn.....	.....	rad-rd....	½-ell...	plat...	left....	cent...	Horner.....F
none...	none....	.....	.....	Zenith.....	spl-press..	.....	selec...	unit-m....	3	.....	.....	.....	.....	ellip...	cant*..	.....	.....	Hannibal.....A
none...	none....	.....	.....	Schebler.....	splash....	cont-b...	ind-c...	amid.....	2	9.10 –1	dbl chn.....	.....	rad-rd....	ellip...	ellip...	right...	right...	I.H.C.....MA
cent...	motor...	1,300	18	Holley.....	spl-press..	cont-b...	ind-c...	amid.....	2	9.10 –1	dbl chn.....	.....	rad-rd....	ellip...	ellip...	right...	right...	I.H.C.....MW
cent...	motor...	1,300	17½	Holley.....	spl-press..	cont-b...	ind-c...	amid.....	2	9.10 –1	dbl chn.....	.....	rad-rd....	½-ell...	ellip...	right...	right...	I.H.C.....E
cent...	motor...	1,350	17	Holley.....	spl-press..	cone....	selec...	amid.....	3	8.00 –1	int-gear.....	springs...	springs...	½-ell...	plat...	left....	cent...	I.H.C.....F
suct...	motor...	1,350	18	Marvel.....	circ-spl...	dry-d...	selec...	unit-m....	3	7.75 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Independent.....F
suct...	motor...	1,200	15	Marvel.....	circ-spl...	dry-d...	selec...	unit-m....	3	8.66 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Independent.....G
cent...	motor...	1,400	20	Schebler.....	spl-press..	dry-p...	selec...	unit-m....	3	7.75 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Indiana.....S
cent...	motor...	1,200	17	Schebler.....	spl-press..	dry-p...	selec...	amid.....	3	7.70 –1	top worm.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Indiana.....D
cent...	motor...	1,200	14½	Schebler.....	spl-press..	dry-p...	selec...	amid.....	3	8.70 –1	top worm.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Indiana.....R
cent...	motor...	1,200	12	Schebler.....	spl-press..	dry-p...	selec...	amid.....	3	11.75 –1	top worm.....	.....	rad-rd....	½-ell...	½-ell...	left....	.....	Indiana.....L
cent...	duplex..	1,112	14	Stromberg...	spl-press..	dry-p...	ind-c...	amid.....	4	8.50 –1	int-g-4.....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Jeffery.....4015
none...	none....	.....	.....	Holley.....	circ-spl...	cone....	selec...	unit-m....	3	4.37 –1	bevel.....	springs...	springs...	½-ell...	½-ell...	right...	cent...	Kearns.....L
none...	none....	1,600	40	Marvel.....	circ-spl...	cone....	selec...	unit-m....	3	4.37 –1	bevel.....	tor-t.....	tor-t.....	½-ell...	½-ell...	right...	cent...	Kearns.....D
l-b....	motor...	1,200	15	Rayfield.....	pressure..	cone....	selec...	unit-j.....	3	8.60 –1	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Kelly-Springfield...K-30
l-b....	motor...	1,200	14	Rayfield.....	pressure..	cone....	selec...	unit-j.....	3	8.60 –1	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Kelly-Springfield...K-31
l-b....	motor...	1,200	11½	Rayfield.....	pressure..	cone....	selec...	unit-j.....	3	11.30 –1	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Kelly-Springfield...K-35
l-b....	motor...	900	9	Rayfield.....	pressure..	cone....	selec...	unit-j.....	3	11.00 –1	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Kelly-Springfield...K-40
l-b....	motor...	900	8	Rayfield.....	pressure..	cone....	selec...	unit-j.....	3	12.00 –1	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Kelly-Springfield...K-45
l-b....	motor...	900	8	Rayfield.....	pressure..	cone....	selec...	unit-j.....	3	12.00 –1	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Kelly-Springfield...K-50
l-b....	motor...	900	8	Rayfield.....	pressure..	cone....	selec...	unit-j.....	3	13.00 –1	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Kelly-Springfield...K-60
cent...	motor...	1,000	12	Schebler.....	spl-press..	dry-d...	ind-c...	unit-j.....	3	8.62 –1	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	right...	right...	King.....
cent...	motor...	1,160	22	Stromberg...	circ-spl...	cone....	selec...	unit-m....	3	4.58 –1	bevel.....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Kisselkar.....
cent...	motor...	1,120	17	Stromberg...	circ-spl...	cone....	selec...	unit-m....	3	3.92 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Kisselkar.....
cent...	motor...	1,295	15	Stromberg...	circ-spl...	cone....	selec...	amid.....	4	7.86 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Kisselkar.....
cent...	motor...	1,350	13	Stromberg...	circ-spl...	cone....	selec...	unit-j.....	4	9.90 –1	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Kisselkar.....
cent...	motor...	1,118	10	Stromberg...	circ-spl...	cone....	selec...	unit-j.....	4	11.10 –1	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Kisselkar.....
cent...	motor...	1,160	9	Stromberg...	circ-spl...	cone....	selec...	unit-j.....	4	12.70 –1	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Kisselkar.....
cent...	motor...	1,100	18	Schebler.....	spl-press..	wet-d...	selec...	amid.....	3	6.50 –1	top worm....	springs...	springs...	½-ell...	½-ell...	right...	cent...	Kleiber.....1
cent...	motor...	1,150	15	Schebler.....	spl-press..	wet-d...	selec...	amid.....	3	8.00 –1	top worm....	springs...	springs...	½-ell...	½-ell...	right...	cent...	Kleiber.....2
cent...	motor...	1,200	14	Schebler.....	spl-press..	wet-d...	selec...	amid.....	3	10.00 –1	top worm....	springs...	springs...	½-ell...	½-ell...	right...	cent...	Kleiber.....3
cent...	motor...	1,050	14	Schebler.....	spl-press..	wet-d...	selec...	amid.....	4	8.75 –1	top worm....	springs...	springs...	½-ell...	½-ell...	right...	cent...	Kleiber.....5
cent...	motor...	1,000	15	Stromberg...	spl-press..	dry-d...	selec...	unit-m....	3	9.25 –1	top worm....	springs...	rad-rd....	½-ell...	½-ell...	left....	cent...	Knickerbocker.....16
cent...	motor...	1,000	12	Stromberg...	spl-press..	dry-d...	selec...	unit-m....	3	10.33 –1	top worm....	springs...	rad-rd....	½-ell...	½-ell...	left....	cent...	Knickerbocker.....16
none...	none....	2,000	20	Zenith.....	pressure..	dry-p...	selec...	amid.....	3	12.00 –1	dbl chn.....	.....	rad-rd....	½-ell...	cant....	left....	cent...	Knox Tractor.....35
none...	none....	2,050	30	opt.....	circ-spl...	cone....	selec...	unit-m....	3	7.00 –1	int-gear.....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Koehler.....K
none...	none....	.....	30	Holley*.....	spl-press..	dry-p...	selec...	unit-m....	3	.....	bevel.....	tor-t.....	springs...	½-ell...	½-ell...	left*...	cent...	Kosmath.....15
cent...	motor...	1,190	20	Schebler.....	circ-spl...	cone....	selec...	amid.....	3	6.00 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Krebs.....F
cent...	motor...	1,025	15	Schebler.....	circ-spl...	cone....	selec...	amid.....	3	6.75 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Krebs.....G
cent...	motor...	1,100	15	Schebler.....	circ-spl...	cone....	selec...	amid.....	4	7.75 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Krebs.....H
cent...	motor...	1,273	13	Schebler.....	circ-spl...	cone....	selec...	amid.....	4	10.33 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Krebs.....I
.....	.....	1,700	20	Schebler.....	circ-spl...	none....	fric.....	.....	inf....	.....	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	.....	Lambert.....V1
.....	.....	1,500	15	Schebler.....	circ-spl...	none....	fric.....	.....	inf....	.....	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	.....	Lambert.....V3
.....	.....	1,500	15	Schebler.....	circ-spl...	none....	fric.....	.....	inf....	.....	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	.....	.....	Lambert.....V5
.....	.....	1,000	15	Rayfield.....	circ-spl...	dry-d...	selec...	unit-m....	3	7.00 –1	int-gear.....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Landshaft.....GI
.....	.....	900	12	Rayfield.....	circ-spl...	dry-d...	selec...	unit-m....	3	7.00 –1	int-gear.....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Landshaft.....JI
cent...	motor...	1,250	15	Stromberg...	circ-spl...	wet-d...	ind-c...	.....	3	8.00 –1	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Lange.....C
cent...	motor...	1,250	15	Stromberg...	circ-spl...	wet-d...	ind-c...	amid.....	3	9.21 –1	dbl chn.....	.....	rad-rd....	½-ell...	½-ell...	left....	cent...	Lange.....B
cent...	motor...	1,200	14	Schebler.....	circ-spl...	dry-d...	selec...	unit-m....	3	8.66 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Larrabee.....
cent...	motor...	1,200	14	Schebler.....	circ-spl...	dry-d...	selec...	unit-m....	3	8.66 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Larrabee.....
none...	none....	2,000	25	Zenith.....	spl-press..	cone....	selec...	unit-m....	3	5.80 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Lippard-Stewart.....M
cent*...	motor...	1,800*	20*	Zenith.....	spl-press..	cone....	selec...	amid.....	3	6.00 –1	top worm*...	springs...	springs...	½-ell...	½-ell...	left....	cent...	Lippard-Stewart.....W
cent...	motor...	1,800	20	Zenith.....	spl-press..	cone....	selec...	amid.....	3	6.75 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Lippard-Stewart.....H
cent...	motor...	1,800	18	Zenith.....	spl-press..	cone....	selec...	amid.....	3	7.75 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Lippard-Stewart.....F
cent...	motor...	1,800	15	Zenith.....	spl-press..	cone....	selec...	amid.....	3	9.25 –1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Lippard-Stewart.....G

ABBREVIATIONS: (continued). **Governor Type,** cent, *centrifugal;* l-b, *loose-ball;* suct, *suction;* hyd, *hydraulic;* elec, *electric.* **Governor Drive,** motor, *from motor;* d-shaft, *from driving shaft;* f-wheel, *from front wheel;* duplex, *from both the motor and driving shaft by overrunning clutches.* **Lubrication,** splash, *non-circulating or simple splash;* circ-spl, *circulating splash;* spl-press, *splash pressure;* fuel-inj, *fuel injection oil mixed with fuel;* pressure, *pressure feed, no splash.* **Clutch Type,** dry-p, *dry plate;* dry-d, *dry multiple disk;* wet-d, *wet disk or disk in oil;* wet-p, *wet plate or plate-in-oil;* r-cone, *reversed cone or inverted cone;* cont-b, *contracting band;* exp-s, *expanding shoe.* **Gearset Type,** prog, *progressive sliding gear;* selec, *selective sliding gear;* plan, *planetary;* ind-c, *constant-mesh, individual-clutch;* fric, *friction;* elec, *electric.* **Gearset Location,** amid, *amidships;* unit-m, *unit with motor;* unit-j, *unit with jackshaft;* unit-x, *unit with axle.* **Gearset Speeds,** inf, *infinite number.* **Final Drive,** int-g, int-gear, *internal-gear;* sing chn, *single chain* dbl chn, *double chain;* doub-red, *double reduction;* spur-g, *spur gears;* sp-bev, *spiral bevel;* f, *front wheel or wheels;* 4, *four-wheel driven.* **Torque Taken By,** rad-rd, *radius rods;* tor-arm, *torque arm;* tor-t, *torsion tube;* sub-f, *sub-frame.* **Propulsion Taken By,** rad-rd, *radius rod;* tor-t. *torsion tube;* tor-arm, *torque arm;* sub-f, *sub-f ame.* **Springs,** ellip, *elliptic;* ½-ell, *half elliptic;* ¼-ell, *quarter elliptic;* ¾-ell, *three-quarters elliptic;* plat, *platform;* cant, *cantilever.* **Control Levers,** cent, *center;* c & r, *gearshift center, brake right;* c & l, *gearshift center, brake left.*

Technical Specifications of Gasoline

Name and Model	Capacity in Pounds	Price of Chassis	Wheelbase in Inches	TIRES			MOTOR								COOLING		IGNITION		
				Kind	SIZES IN INCHES		Location	No. of Cylinders	No. of Crankshaft Bearings	Bore and Stroke	N.A.C.C. Hp.	Cylinders Cast	Valves Placed		Water Circulation	Radiator Core and Case	Type	Make	Spark Advance
					Front	Rear													
Little Giant.....15	1,500	1,500	120	p & s....	34x4½	34x3½	under hood..	4	3	3½x4	19.61	block...	right...		thermo..	fin-sheet....	dual...	Eisemann....	hand...
Little Giant.....H	3,000	1,450	110	solid....	37x3½	37x4	under flr....	4	3	3½x5½	19.61	block...	right...		thermo..	fin-sheet....	dual...	Eisemann....	hand...
Little Giant.....16	4,000	2,500	144	solid....	36x4	36x3½d	under hood..	4	3	4½x5½	27.20	block...	right...		thermo..	fin-sheet....	dual...	Eisemann....	hand...
Lincoln.....D	1,500	900	122	pneu....	33x5	33x5	under hood..	4	3	3½x5	22.50	block...	head...		thermo..	fin-cast.....	sing....	Bosch.....	fixed...
Locomobile.....B	6,000	3,500	150	solid....	36x5	36x5d	under hood..	4	5	4½x6	29.00	pairs...	opp....		cent....	cell-sheet...	dual...	Bosch.....	hand...
Locomobile.....BB	8,000	3,650	150	solid....	36x5	36x6d	under hood..	4	5	4½x6	29.00	pairs...	opp....		cent....	cell-sheet...	dual...	Bosch.....	hand...
Lombard.....	10,000	.....	.....	steel....	40x6	creeper..	under hood..	4	.....	.....	.....	pairs...	.....		cent....	fin-sheet....	dual...	.....	hand...
Maccar.....K	2,000	2,100	150*	solid....	36x4	36x5	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	cell-sheet...	sing....	.....	hand...
Maccar.....L	2,000	2,100	150*	solid....	36x4	36x5	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	cell-sheet...	sing....	.....	hand...
Maccar.....J	4,000	2,600	162*	solid....	36x4	36x4d	under hood..	4	3	4½x5½	32.40	pairs...	left....		cent....	cell-sheet...	sing....	opt.....	hand...
Maccar.....H	4,000	2,600	162*	solid....	36x4	36x4d	under hood..	4	3	4½x5½	32.40	pairs...	left....		cent....	cell-sheet...	sing....	opt.....	hand...
Maccar.....O	7,000	3,250	174*	solid....	36x5	36x5d	under hood..	4	3	4½x5½	32.40	pairs...	left....		cent....	cell-sheet...	sing....	opt.....	hand...
Maccar.....M	7,000	3,250	174*	solid....	36x5	36x5d	under hood..	4	3	4½x5½	32.40	pairs...	left....		cent....	cell-sheet...	sing....	opt.....	hand...
Mack.....AB	2,000	2,000	144*	solid*...	36x4*	36x3½d*	under hood..	4	3	4 x5	25.60	pairs...	right...		cent....	cell-sheet...	sing....	Bosch.....	fixed...
Mack.....AB	3,000	2,350	144*	solid*...	36x4*	36x3½d*	under hood..	4	3	4 x5	25.60	pairs...	right...		cent....	cell-sheet...	sing....	Bosch.....	fixed...
Mack.....AB	4,000	2,700	144*	solid*...	36x4*	36x4d*	under hood..	4	3	4 x5	25.60	pairs...	right...		cent....	cell-sheet...	sing....	Bosch.....	fixed...
Mack.....AC	7,000	3,400	168*	solid....	36x5	40x5d	under hood..	4	3	5 x6	40.00	pairs...	right...		cent....	ring-cast....	dual...	Bosch.....	hand...
Mack.....AC	11,000	4,000	168*	solid....	36x5	40x6d	under hood..	4	3	5 x6	40.00	pairs...	right...		cent....	ring-cast....	dual...	Bosch.....	hand...
Mack.....AC	15,000	4,500	180	solid....	37x7	41x7d	under hood..	4	3	5 x6	40.00	pairs...	right...		cent....	ring-cast....	dual...	Bosch.....	hand...
Mack Tractor.....AC	30,000	4,000	116½	solid....	36x5	40x6d	under hood..	4	3	5 x6	40.00	pairs...	right...		cent....	ring-cast....	dual...	Bosch.....	hand...
Mais.....C&D	3,000	2,600	132*	solid....	36x4	36x5	under hood..	4	3	4 x5½	25.60	block...	opp....		cent....	cell-sheet...	sing....	Eisemann....	auto...
Mais.....E&F	4,000	2,800	145*	solid....	36x5	36x7	under hood..	4	3	4 x5½	25.60	block...	opp....		cent....	cell-sheet...	sing....	Eisemann....	auto...
Mais.....K, L&H	6,000	3,300	132*	solid....	36x5	36x5d	under hood..	4	.....	4¼x5½	29.75	block...	opp....		cent....	cell-sheet...	sing....	Eisemann....	auto...
Mais.....M	8,000	3,750	145*	solid....	36x6	36x6d	under hood..	4	.....	4¼x5½	29.75	block...	opp....		cent....	cell-sheet...	sing....	Eisemann....	auto...
Martin.....R	2,000	2,050	130	solid....	36x3½	36x4	under hood..	4	3	4 x5	25.60	block...	left....		cent....	fin-sheet....	dual...	Bosch.....	hand...
Martin.....S	4,000	2,150	121	solid....	36x3½	40x4	under flr....	4	3	4 x5	25.60	block...	left....		cent....	fin-sheet....	dual...	Bosch.....	hand...
Martin.....E	5,000	2,800	135	solid....	36x4	40x3½d	under flr....	4	3	4½x5	29.00	pairs...	opp....		cent....	fin-sheet....	dual...	Bosch.....	hand...
Martin.....L	8,000	3,300	145	solid....	36x5	40x4d	under flr....	4	3	4½x5½	36.15	pairs...	opp....		cent....	fin-sheet....	dual...	Bosch.....	hand...
Menominee.....E	1,500	1,125	124	solid....	34x3½	34x3½	under hood..	4	3	3½x5	22.50	block...	right...		thermo..	fin-sheet....	sing....	Bosch.....	hand...
Menominee.....F	2,500	1,575	130*	solid....	36x3½	36x5	under hood..	4	3	3½x5½	22.50	block...	left....		cent....	fin-sheet....	sing....	Bosch.....	hand...
Menominee.....D	4,000	2,240	144	solid....	36x4	36x6*	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	fin-sheet....	sing....	Bosch.....	hand...
Mercury.....P	1,000	650	85	solid....	34x2	36x2	under body..	2	2	4½x4	14.50	sing....	top....		air.....	none.....	dual...	Remy.....	2-pt....
Mercury..Bulley Tract A	.....	3,400	71	solid....	3-wheel	.....	under hood..	4	5	4½x5	32.40	pairs...	opp....		cent....	cell-sheet...	.....	.....	hand...
Mercury..Bulley Tractor.	.....	3,400	71	solid....	34x4	.....	under hood..	4	5	4½x5	32.40	pairs...	opp....		cent....	cell-sheet...	.....	.....	hand...
Modern.....T	2,000	.....	132*	solid....	36x3	36x4	under hood..	4	3	3½x5	19.61	block...	right...		thermo..	fin-cast.....	sing....	Bosch.....	fixed...
Modern.....N	3,000	.....	144*	solid....	36x3½	36x5	under hood..	4	3	3½x5	22.50	block...	right...		cent....	fin-cast.....	sing....	Bosch.....	fixed...
Modern.....R	4,000	.....	150*	solid....	36x4	36x4d	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	fin-cast.....	sing....	Bosch.....	fixed...
Modern.....B	7,000	.....	176*	solid....	38x5	38x5d	under hood..	4	3	4¼x6½	36.15	pairs...	right...		cent....	fin-cast.....	sing....	Eisemann....	fixed...
Moon.....B	3,000	1,650	140*	solid....	36x3½	36x5	under hood..	4	3	3½x5½	22.50	block...	l & h...		cent....	sq-t-sheet...	dual...	Bosch.....	hand...
Moore.....	5,000	2,500	162½	solid....	36x4	36x3½d	under hood..	4	3	4½x5½	32.40	pairs...	left....		cent....	cell-sheet...	dual...	Splitdorf....	hand...
Moore.....	10,000	4,500	175	solid....	36x3	42x6d	under hood..	4	3	5½x7	44.20	pairs...	opp....		cent....	fin-sheet....	dual...	Splitdorf....	hand...
Moreland.....	2,000	1,550	126	solid....	34x3½	34x4	under hood..	4	3	3½x5	22.50	block...	left....		thermo..	cell-cast....	sing....	Bosch.....	hand...
Moreland.....	3,000	1,850	126*	solid....	34x3½	34x5	under hood..	4	3	4½x5½	27.20	block...	right...		cent....	cell-cast....	sing....	Bosch.....	hand...
Moreland.....	5,000	2,400	168*	solid....	34x4	34x4d	under hood..	4	3	4½x5½	32.40	pairs...	left....		cent....	cell-cast....	sing....	Bosch.....	hand...
Moreland.....	8,000	3,200	186*	solid....	36x5	38x5d	under hood..	4	3	4¼x6½	36.15	pairs...	left....		cent....	cell-cast....	sing....	Bosch.....	hand...
Morton.....	6,000	.....	112	solid....	40x6	40x6	btw seats...	4	3	4¼x6½	36.15	pairs...	left....		cent....	cell-sheet...	dual...	Dixie.....	hand...
Nelson & LeMoon...E1	2,000	1,700	opt...	solid....	36x3	36x4	under hood..	4	3	3½x5½	22.50	block...	left....		cent....	sq-t-sheet...	sing....	Bosch.....	.....
Nelson & LeMoon...E2	4,000	2,250	opt...	solid....	36x4	36x7	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	sq-t-sheet...	dual...	Bosch.....	.....
Nelson & LeMoon...E3	6,000	2,950	opt...	solid....	36x5	38x5d	under hood..	4	3	4½x5½	32.40	pairs...	left....		cent....	sq-t-sheet...	dual...	Bosch.....	auto...
Netco.....C	3,000	2,250	144*	solid....	36x3½	36x5	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	fin-cast.....	sing....	Eisemann....	fixed...
Netco.....D	4,000	2,350	144*	solid....	36x4	36x6	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	fin-cast.....	sing....	Eisemann....	fixed...
New York.....L	3,000	1,800	129*	solid....	36x3½	36x5	under hood..	4	3	3½x5½	22.50	block...	left....		cent....	sq-t-sheet...	sing....	Bosch.....	fixed...
Old Reliable.....	3,000	1,950	138*	solid....	34x3½	36x6	under hood..	4	3	3½x5	22.50	block...	left....		cent....	fin-sheet....	sing....	Bosch.....	hand...
Old Reliable.....	4,000	2,750	120*	solid....	34x4	36x4d	under flr....	4	3	4½x5	29.00	pairs...	opp....		cent....	fin-sheet....	sing....	Bosch.....	hand...
Old Reliable.....	8,000	3,750	126*	solid....	36x5	36x5d	under flr....	4	3	4½x5½	36.15	pairs...	opp....		cent....	fin-sheet....	sing....	Bosch.....	hand...
Old Reliable.....	10,000	4,250	126*	solid....	36x6	36x6d	under flr....	4	3	4½x5½	36.15	pairs...	opp....		cent....	fin-sheet....	sing....	Bosch.....	hand...
Old Reliable.....	12,000	4,500	126*	solid....	36x6	40x7d	under flr....	4	3	4¼x6½	36.15	pairs...	left....		cent....	fin-sheet....	sing....	Bosch.....	hand...
Overland.....83	800	750-c	106	pneu....	33x4	33x4	under hood..	4	5	4½x4½	27.20	sing....	left....		thermo..	cell-sheet...	sing....	Splitdorf....	hand...
Packard.....1D	2,000	2,200	126*	solid....	34x3½	34x6	under hood..	4	4	4 x5½	25.60	block...	right...		cent....	cell-sheet...	dual...	Dixie.....	hand...
Packard.....1½D	3,000	2,500	126*	solid....	34x3½	34x3½d	under hood..	4	4	4 x5½	25.60	block...	right...		cent....	cell-sheet...	dual...	Dixie.....	hand...
Packard.....2D	4,000	2,800	144*	solid....	34x4	34x4d	under hood..	4	4	4 x5½	25.60	block...	right...		cent....	cell-sheet...	dual...	Dixie.....	hand...
Packard.....3D	6,000	3,400	156*	solid....	36x5	36x5d	under hood..	4	4	4½x5½	32.40	block...	right...		cent....	cell-sheet...	dual...	Dixie.....	hand...
Packard.....4D	8,000	3,800	156*	solid....	36x5	40x5d	under hood..	4	4	4½x5½	32.40	block...	right...		cent....	cell-sheet...	dual...	Dixie.....	hand...
Palmer.....	2,000	1,350	115½	pneu*...	35x4½*	35x4½*	under hood..	4	3	3½x5	22.50	block...	right...		thermo..	cell-cast....	sing....	Bosch.....	fixed...
Palmer.....	4,000	1,975	144	solid....	36x3½	36x3½d	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	cell-cast....	sing....	Bosch.....	fixed...
Palmer-Moore.....K	1,500	1,150	106	solid*...	36x3*	36x3½*	under hood..	4	3	3½x5½	19.61	block...	r & h...		thermo..	fin-cast.....	sing....	Bosch.....	auto...
Palmer-Moore.....M	2,000	1,350	126	solid*...	36x3½*	36x4*	under hood..	4	3	3½x5½	22.50	block...	r & h...		thermo..	fin-cast.....	sing....	Bosch.....	auto...
Paulding.....DI	1,500	975	120*	solid....	36x3	36x3	under hood..	4	3	3½x5	16.92	block...	right...		thermo..	z-z-t-sheet..	dual...	Kingston.....	hand...
Paulding.....G-GI	2,000	1,300	120*	solid....	36x3½	36x4	under hood..	4	3	4 x5	25.60	block...	right...		thermo..	z-z-t-sheet..	dual...	Kingston.....	hand...
Paulding.....E-EI	3,000	1,600	130*	solid....	36x4	36x5	under hood..	4	4	4 x6	25.60	block...	right...		thermo..	z-z-t-sheet..	dual...	Kingston.....	hand...
Paulding.....H-HI	4,000	1,950	160*	solid....	36x4	36x4d	under hood..	4	4	4½x6	29.00	block...	right...		thermo..	z-z-t-sheet..	dual...	Kingston.....	hand...

ABBREVIATIONS: General, *, *with other option;* opt, *optional.* **Price,** -c, *complete with body.* **Tires, Kind,** Pneu, *pneumatic;* Cush, *cushion;* p&s, *pneumatic in front and solid in rear;* s & st, *solid in front and steel in rear.* **Tire Sizes,** d, *dual.* **Motor Location,** btw seats, *between seats;* under flr, *under floor.* **Cylinders Cast,** sing, *singly or individually.* **Location of Valves,** opp, *opposite or T-head type;* top (two-cylinder motors only), *L-head cylinder laid horizontal with valves up;* r & h, *at right and in head, L-head cylinder;* l & h, *at left and in head, L-head cylinder;* 2-cyc, *two-cycle Motor, no valves.* **Water Circulation,** cent, *centrifugal pump;* gear, *gear pump;* thermo, *thermo-syphon circulation;* air, *air-cooled, no water.* **Radiator Type and Case,** fin-sheet, *finned-tube core with sheet metal casing;* fin-cast, *finned-tube core with cast aluminum casing;* sq-t-sheet, *square tube or flat tube core with sheet metal casing;* sq-t-cast, *square tube core with cast aluminum casing;* cell-sheet, *cellular or honeycomb core with sheet metal casing;* cell-cast, *cellular core with cast aluminum casing;* z-z-t-sheet, *zig-zag tube core with sheet metal casing;* z-z-t-cast, *zig-zag tube core with cast aluminum casing;* ring-cast, *copper tube core arranged in a ring about a centrifugal fan with a cast aluminum casing.* **Ignition, Type,** sing, *single;* doub, *double.* **Make of Magneto** (or other sparking device), Atw. Kent, *Atwater Kent.* **Spark Advance,** auto, *automatic;* auto-h, *automatic advance with hand adjustment;* 2-pt, *two-point fixed, battery circuit fixed in retard magneto in advance*

Commercial Vehicles for 1916—Continued

MOTOR						TRANSMISSION								SPRINGS		CONTROL		
GOVERNOR		SPEED					GEARSET											
Type	Drive	Motor in r.p.m.	Truck in m.p.h.	Carbureter Make	Lubrication	Clutch Type	Type	Location	Speeds	Total Gear Reduction in High	Final Drive	Torque Taken By	Propulsion Taken By	Front	Rear	Steer	Levers	Name and Model
cent	motor	1,100	18½	Schebler	spl-press	dry-d	selec	unit-m	3	6.00 –1	top worm	tor-t	springs	½-ell	½-ell	right	cent	Little Giant 15
		1,200	15	Schebler	spl-press	wet-d	selec	unit-j	3	6.88 –1	dbl chn		rad-rd	½-ell	½-ell	left	cent	Little Giant H
cent	motor	1,100	15	Schebler	spl-press	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell	½-ell	right	cent	Little Giant 16
		1,500		Stromberg	circ-spl	cone	selec	unit-m	3	6.00 –1	bevel	tor-arm	springs	ellip	ellip	left*	cent*	Lincoln D
l-b	motor	1,350	14½	Locomobile	spl-press	cone	selec	amid	4	8.75*–1	top worm	tor-arm	rad-rd	½-ell	½-ell	right	right	Locomobile B
l-b	motor	1,350	14½	Locomobile	spl-press	cone	selec	amid	4	10.00 –1	top worm	tor-arm	rad-rd	½-ell	½-ell	right	right	Locomobile BB
cent	motor	1,400	6		press	wet-d			3		top worm					left		Lombard
cent	motor	1,000	16	Stromberg	spl-press	dry-d	selec	amid	3	6.75 –1	dbl chn		rad-rd	½-ell	plat	left	cent	Maccar K
cent	motor	1,000	16	Stromberg	spl-press	dry-d	selec	amid	3	6.75 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Maccar L
cent	motor	1,000	13	Stromberg	spl-press	dry-d	selec	unit-m	3	8.50 –1	dbl chn		rad-rd	½-ell	plat	left	cent	Maccar J
cent	motor	1,000	13	Stromberg	spl-press	dry-d	selec	unit-m	3	8.50 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Maccar H
cent	motor	1,000	11	Stromberg	spl-press	dry-d	selec	unit-m	3	10.33 –1	dbl chn		rad-rd	½-ell	plat	left	cent	Maccar O
cent	motor	1,000	11	Stromberg	spl-press	dry-d	selec	unit-m	3	10.33 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Maccar M
cent	motor	1,160	18½	Stromberg	spl-press	dry-d	selec	unit-m	3	6.75 –1	top worm	springs	springs	½-ell	½-ell	left*	cent	Mack AB
cent	motor	1,160	16	Stromberg	spl-press	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell	½-ell	left*	cent	Mack AB
cent	motor	1,160	16	Stromberg	spl-press	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell	½-ell	left*	cent	Mack AB
cent	motor	1,000	15½	Stromberg	spl-press	dry-p	selec	unit-j	3	7.54 –1	dbl chn		rad-rd	½-ell	½-ell	left	cent	Mack AC
cent	motor	1,000	11½	Stromberg	spl-press	dry-p	selec	unit-j	3	10.50 –1	dbl chn		rad-rd	½-ell	½-ell	left	cent	Mack AC
cent	motor	1,000	8½	Stromberg	spl-press	dry-p	selec	unit-j	3	14.10 –1	dbl chn		rad-rd	½-ell	½-ell	left	cent	Mack AC
cent	motor	1,000	8½	Stromberg	spl-press	dry-p	selec	unit-j	3	14.10 –1	dbl chn		rad-rd	½-ell	½-ell	left	cent	Mack Tractor AC
l-b	gearset	1,150	15	Rayfield	circ-spl	exp-s	prog	unit-m	3		int-gear	tor-t	rad-rd	½-ell	½-ell	left	left	Mais C&D
l-b	gearset	1,150	15	Rayfield	circ-spl	exp-s	prog	unit-m	3		int-gear	tor-t	rad-rd	½-ell	½-ell	left	left	Mais E&F
l-b	gearset	1,250	12	Rayfield	circ-spl	exp-s	prog	unit-m	3		int-gear	tor-t	rad-rd	½-ell	½-ell	left	left	Mais K, L&H
l-b	gearset	1,250	12	Rayfield	circ-spl	exp-s	prog	unit-m	3		int-gear	tor-t	rad-rd	½-ell	½-ell	left	left	Mais M
		1,200	18	Stromberg	pressure	wet-d	selec	unit-m	3	7.95 –1	dbl chn*		rad-rd	½-ell	½-ell	left	cent	Martin R
		1,200	16	Stromberg	pressure	wet-d	selec	unit-j	3	9.02 –1	dbl chn*		rad-rd	½-ell	½-ell	right	right	Martin S
		1,200	15	Stromberg	pressure	wet-d	selec	unit-j	3	10.40 –1	dbl chn*		rad-rd	½-ell	½-ell	right	right	Martin E
		1,000	12	Stromberg	pressure	wet-d	selec	unit-j	3	10.44 –1	dbl chn*		rad-rd	½-ell	½-ell	right	right	Martin L
cent	d-shaft	1,286	25	Stromberg	circ-spl	dry-d	selec	unit-m	3	5.16 –1	sp-bev	springs	rad-rd	½-ell	½-ell	left		Menominee E
cent	d-shaft	1,308	16	Stromberg	circ-spl	dry-d	selec	unit-m	3	5.16 –1	top worm	springs	rad-rd	½-ell	½-ell	left	cent	Menominee F
cent	d-shaft	1,210	14	Stromberg	circ-spl	dry-d	selec	unit-m	3	9.25 –1	top worm	springs	rad-rd	½-ell	½-ell	left	cent	Menominee D
none	none			Schebler	circ-spl	dry-d	plan	unit-m	2	9.00 –1	dbl chn		rad-rd	ellip	ellip	right	right	Mercury P
cent	motor		12		circ-spl	cone	ind-c	unit-m	3		dbl chn		rad-rd	coil	½-ell	right	right	Mercury..Bulley Tract A
cent	motor		12		circ-spl	cone	ind-c	unit-m	3		dbl chn		rad-rd	½-ell	½-ell	right	right	Mercury..Bulley Tractor
none	none			Zenith	spl-press	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell	½-ell	right	cent	Modern T
none	none			Zenith	spl-press	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	rad-rd	½-ell	½-ell	right		Modern N
				Zenith	spl-press	dry-d	selec	unit-m	3	8.50 –1	top worm	springs	rad-rd	½-ell	½-ell	right		Modern R
				Zenith	spl-press	cone	selec	amid	4	8.75 –1	top worm	springs	rad-rd	½-ell	½-ell	right		Modern B
none	none			Stromberg	circ-spl	cone	prog	unit-j	3	5.62 –1	bevel		rad-rd	½-ell	½-ell	left	cent	Moon B
cent	motor	1,100	17	Master	circ-spl	cone	selec	unit-j	3	6.50 –1	dbl chn		rad-rd	½-ell	½-ell	left	cent	Moore
cent	motor	1,000	12	Master	circ-spl	cone	selec	unit-j	4	9.05 –1	dbl chn		rad-rd	½ ell	½-ell	right	right	Moore
none	none	1,150	18	Master*	circ-spl	dry-d	selec	unit-m	3	6.00 –1	top worm	tor-arm	springs	½-ell	½-ell	right	cent	Moreland
none	none	1,120	15	Master*	circ-spl	dry-p	selec	unit-m	3	6.75 –1	top worm	springs	rad-rd	½-ell	½-ell	right	cent	Moreland
cent	motor	1,050	14	Master*	circ-spl	dry-p	selec	unit-m	4	6.80 –1	top worm	springs	rad-rd	½-ell	½-ell	right	cent	Moreland
cent	motor	1,000	12	Master*	circ-spl	dry-p	selec	amid	4	7.80 –1	top worm	springs	rad-rd	½-ell	½-ell	right	cent	Moreland
cent	motor	1,250	25½	Carter	pressure	wet-d	selec	amid	4	5.60 –1	top worm-4	springs	springs			right	right	Morton
suct	motor	1,000	16	Rayfield	circ-spl	dry-d	selec	unit-m	3	6.75 –1	top worm			½-ell	½-ell	right	cent	Nelson & LeMoon E1
suct	motor	1,000	14	Rayfield	circ-spl	dry-d	selec	unit-m	3	8.75 –1	top worm			½-ell	½-ell	right	cent	Nelson & LeMoon E2
suct	motor	1,000	12	Rayfield	circ-spl	dry-d	selec	unit-m	3*	8.75 –1*	top worm			½-ell	½-ell	right	cent	Nelson & LeMoon E3
cent	d-shaft	1,200	15	Zenith	circ-spl	dry-p	selec	unit-m	3	7.50 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Netco C
cent	d-shaft	1,200	15	Zenith	circ-spl	dry-p	selec	unit-m	3	7.50 –1	top worm	springs	springs	½-ell	½-ell	left	cent	Netco D
hyd	motor		18	Stromberg	spl-press	cone	selec	amid	3		top worm*		rad-rd	½-ell	½-ell	right	right	New York L
none	none		16	Stromberg	spl-press	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs	½-ell	½-ell	right	cent	Old Reliable
none	none		16	Stromberg	spl-press	wet-d	selec	unit-j	3	8.23 –1	dbl chn		rad-rd	½-ell	½-ell	right	right	Old Reliable
none	none		14	Stromberg	spl-press	wet-d	selec	unit-j	3	8.14 –1	dbl chn		rad-rd	½-ell	½-ell	right	right	Old Reliable
none	none		12	Stromberg	spl-press	wet-d	selec	unit-j	3	8.82 –1	dbl chn		rad-rd	½-ell	½ ell	right	right	Old Reliable
l-b	motor	750	10	Stromberg	circ-spl	wet-d	selec	unit-j	3	8.93 –1	dbl chn		rad-rd	½-ell	½-ell	right	right	Old Reliable
none	none		45	Stromberg	circ-spl	cone	selec	unit-x	3	3.69 –1	bevel	tor-t	tor-t	½-ell	½-ell	left	cent	Overland 83
cent	motor	1,000	16	Packard	pressure	dry-d	prog	amid	3	6.25 –1	top worm	tor-arm	rad-rd	½-ell	½-ell	left	left	Packard 1D
cent	motor	1,000	16	Packard	pressure	dry-d	prog	amid	3	6.25 –1	top worm	tor-arm	rad-rd	½-ell	½-ell	left	left	Packard 1½D
cent	motor	1,000	14	Packard	pressure	dry-d	prog	amid	3	7.25 –1	top worm	tor-arm	rad-rd	½-ell	½-ell	left	left	Packard 2D
cent	motor	1,000	12	Packard	pressure	dry-d	prog	amid	3	9.00 –1	top worm	tor-arm	rad-rd	½-ell	½-ell	left	left	Packard 3D
cent	motor	1,000	12	Packard	pressure	dry-d	prog	amid	3	10.00 –1	top worm	tor-arm	rad-rd	½-ell	½-ell	left	left	Packard 4D
none	none			Stromberg	circ-spl	dry-d	selec	unit-m	3		int-gear		springs	½-ell	½-ell	left	cent	Palmer
suct	motor		15	Stromberg	circ-spl	dry-d	selec	unit-m	3		top worm		springs	½-ell	½-ell	left	cent	Palmer
suct	motor	1,275	20	Zenith	circ-spl	dry-d	selec	amid	3	6.83 –1	int-gear	tor-arm	springs	½-ell	½-ell	left		Palmer-Moore K
cent	duplex	1,150	18	Zenith	circ-spl	dry-d	selec	amid	3	6.83 –1	int-gear	tor-arm	springs	½-ell	plat	left		Palmer-Moore M
none	none	1,000	18	Kingston	spl-press	dry-d	selec	unit-m	3	6.00 –1	int-gear		springs	½-ell	plat	left*	cent	Paulding D1
none	none	1,000	18	Kingston	spl-press	dry-d	selec	unit-m	3	6.00 –1	int-gear*		springs*	½-ell	plat	left*	cent	Paulding G-G1
none	none	1,000	15	Kingston	spl-press	dry-d	selec	unit-m	3	7.00 –1	int-gear*		springs*	½-ell	½-ell	left*	cent	Paulding E-E1
none	none	1,000	13½	Kingston	spl-press	dry-d	selec	unit-m	3	8.00 –1	int-gear*		springs*	½-ell	½-ell	left*	cent	Paulding H-H1

ABBREVIATIONS: (continued). **Governor Type,** cent, *centrifugal;* l-b, *loose-ball;* suct, *suction;* hyd, *hydraulic;* elec, *electric.* **Governor Drive,** motor, *from motor;* d-shaft, *from driving shaft;* f-wheel, *from front wheel;* duplex, *from both the motor and driving shaft by overrunning clutches.* **Lubrication,** splash, *non-circulating or simple splash;* circ-spl, *circulating splash;* spl-press, *splash-pressure;* fuel-inj, *fuel injection, oil mixed with fuel;* pressure, *pressure feed, no splash.* **Clutch Type,** dry-p, *dry plate;* dry-d, *dry multiple disk;* wet-d, *wet disk or disk-in-oil;* wet-p, *wet plate or plate-in-oil;* r-cone, *reversed cone or inverted cone;* cont-b, *contracting band;* exp-s, *expanding shoe.* **Gearset Type,** prog, *progressive sliding gear;* selec, *selective sliding gear;* plan, *planetary;* ind-c, *constant-mesh, individual-clutch;* fric, *friction;* elec, *electric.* **Gearset Location,** amid, *amidships;* unit-m, *unit with motor;* unit-j, *unit with jackshaft;* unit-x, *unit with axle.* **Gearset Speeds,** inf, *infinite number.* **Final Drive,** int-g, int-gear, *internal-gear;* sing chn, *single chain;* dbl chn, *double chain;* doub-red, *double reduction;* spur-g, *spur gears;* sp-bev, *spiral bevel;* f, *front wheel or wheels;* 4, *four-wheel driven.* **Torque Taken By,** rad-rd, *radius rods;* tor-arm, *torque arm;* tor-t, *torsion tube;* sub-f, *sub-frame.* **Propulsion Taken By,** rad-rd, *radius rod;* tor-t, *torsion tube;* tor-arm, *torque arm;* sub-f, *sub-frame.* **Springs,** ellip, *elliptic;* ½-ell, *half elliptic;* ¼-ell, *quarter elliptic;* ¾-ell, *three-quarters elliptic;* plat, *platform;* cant, *cantilever.* **Control, Levers,** cent, *center;* c & r, *gearshift center, brake right;* c & l, *gearshift center, brake left.*

Technical Specifications of Gasoline

Name and Model	Capacity in Pounds	Price of Chassis	Wheelbase in Inches	TIRES			MOTOR								COOLING		IGNITION		
				Kind	SIZES IN INCHES		Location	No. of Cylinders	No. of Crankshaft Bearings	Bore and Stroke	N.A.C.C. Hp.	Cylinders Cast	Valves Placed		Water Circulation	Radiator Core and Case	Type	Make	Spark Advance
					Front	Rear													
Peerless.....TC2	4,000	.....	145	solid....	36x4	36x4d	under hood..	4	3	4½x6½	32.40	pairs...	opp....		gear....	fin-sheet....	dual...	Remy.....	hand..*
Peerless.....TC3	6,000	.....	151*	solid....	36x4	40x4d	under hood..	4	3	4½x6½	32.40	pairs...	opp....		gear....	fin-sheet....	dual...	Remy.....	hand...
Peerless.....TC4	8,000	.....	151*	solid....	36x5	40x5d	under hood..	4	3	4½x6½	32.40	pairs...	opp....		gear....	fin-sheet....	dual...	Remy.....	hand...
Peerless.....TC5	10,000	.....	151*	solid....	38x6	42x6d	under hood..	4	3	4½x6½	32.40	pairs...	opp....		gear....	fin-sheet....	dual...	Remy.....	hand...
Peerless.....TC6	12,000	.....	151*	solid....	38x7	42x7d	under hood..	4	3	4½x6½	32.40	pairs...	opp....		gear....	fin-sheet....	dual...	Remy.....	hand...
Pierce-Arrow.....	4,000	3,000	150*	solid....	36x4	36x4d	under hood..	4	.....	4 x5½	25.60	pairs...	opp....		cent....	fin-cast.....	dual...	Bosch.....	hand...
Pierce-Arrow.....	10,000	4,500	168*	solid....	36x5	40x6d	under hood..	4	.....	4½x6	38.25	pairs...	opp....		cent....	fin-cast.....	dual...	Bosch.....	hand...
Reo.....F	1,500	1,000	120	pneu....	34x4½	34x4½	under hood..	4	3	4½x4½	27.20	pairs...	r & h...		cent....	fin-sheet....	sing...	Remy.....	hand...
Reo.....J	4,000	1,650	146	solid....	36x4	36x3½d	under hood..	4	3	4½x4½	27.20	pairs...	r & h...		cent....	fin-cast.....	dual...	National.....	hand...
Republic.....F	1,500	995-c	124	solid*...	34x3*	34x3½*	under hood..	4	3	3½x5	19.61	block...	right...		thermo..	fin-sheet....	sing...	Bosch.....	fixed...
Republic.....E	2,000	1,275	144	solid*...	34x3*	34x4*	under hood..	4	3	3½x5	22.50	block...	right...		thermo..	fin-sheet....	sing...	Bosch.....	fixed...
Republic.....A	4,000	1,475	144	solid....	34x4	34x6*	under hood..	4	3	4½x5½	27.20	block...	right...		cent....	fin-sheet....	sing..	Bosch.....	fixed...
Republic.....T	6,000	2,400	165*	solid....	36x5	36x5d	under hood..	4	3	4½x5½	29.00	block...	right...		cent....	fin-sheet....	sing...	Bosch.....	hand...
Rowe.....CW	2,000	2,450	130	solid....	34x3½	34x4	under hood..	4	3	3½x5	16.92	block...	left....		cent....	sq-t-sheet...	sing...	Bosch.....	hand...
Rowe.....CDW	4,000	2,800	144	solid....	34x4	36x3½d	.....	4	3	4 x5	25.62	block...	left....		cent....	sq-t-sheet...	sing...	Bosch.....	.....
Rowe.....DFW	6,000	3,400	156	solid....	36x5	36x5d	under hood..	4	3	4½x5	29.00	pairs...	opp....		cent....	sq-t-sheet...	sing...	Bosch.....	.....
Rowe.....TW	10,000	4,500	156	solid....	36x6	40x6d	under hood..	4	3	4½x5½	36.15	pairs...	opp....		cent....	sq t-sheet...	sing...	Bosch.....	hand...
Royal.....A	7,000	3,500	148	solid....	36x5	38x5d	under hood..	4	3	4½x5	29.00	pairs...	opp....		cent....	fin-cast.....	dual...	Bosch.....	fixed...
Royal.....A	10,000	4,500	138*	solid....	36x6	40x6d	under hood *	4	3	4½x5½	36.15	pairs...	opp....		cent....	fin-cast.....	dual...	Bosch.....	fixed...
Royal.....A	12,000	4,800	140	solid....	36x6	40x6d	under seats..	4	3	5 1/16x5½	41.61	pairs...	opp..		cent....	fin-cast.....	dual...	Bosch.....	fixed...
R-S.....	350	395	65	pneu....	28x3	28x3	amid.....	2	2	3½x3½	9.12	sing....	back...		air.....	none.....	sing...	Bosch.....	hand...
Salvador.....	4,000	2,000	124*	cush....	36x4½	36x6	btw seats...	4	3	4 x4½	25.60	pairs...	left....		cent....	cell-cast....	sing...	Eisemann....	auto...
Sandow.....	3,000	1,800	150*	solid....	36x3	36x4	under hood..	4	3	3½x5½	22.50	block...	left....		cent....	cell-sheet...	sing...	Bosch.....	hand...
Sandow.....	4,000	2,350	171*	solid....	36x4	36x4d	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	cell-sheet...	sing...	Bosch.....	hand...
Sandow.....	4,000	2,000	171*	solid....	36x4	36x4d	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	cell-sheet...	sing...	Bosch.....	hand...
Sandow.....	6,000	3,000	186*	solid....	36x5	36x5d	under hood..	4	3	4½x5½	32.40	pairs...	left....		cent....	cell-sheet...	sing...	Bosch.....	hand...
Sandow.....	6,000	2,500	186*	solid....	36x5	40x5d	under hood..	4	3	4½x5½	32.40	pairs...	left....		cent....	cell-sheet...	sing...	Bosch.....	hand...
Sanford.....O	1,500	1,290	120	pneu*...	34x4½*	35x5*	under hood..	4	3	3½x5½	19.61	block...	right...		cent....	fin-cast.....	sing...	Splitdorf.....	fixed..
Sanford.....P	2,000	1,350	138	pneu*...	34x4½*	35x5*	under hood..	4	3	3½x5½	19.61	block...	right...		cent....	fin-cast.....	sing...	Splitdorf.....	fixed..
Sanford.....M	4,000	1,910	140	solid....	36x4	36x6	under hood..	4	3	4 x4½	25.60	pairs...	right...		cent....	fin-cast.....	sing...	Splitdorf.....	2-pt...
Saurer.....	10,000	4,800	153½	solid....	36x5	42x5d	under hood..	4	3	4½x5½	30.65	pairs...	opp....		cent....	cell-sheet...	sing...	Bosch.....	hand...
Saurer.....	13,000	5,800	156½	solid....	36x5	42x6d	under hood..	4	3	4½x5½	30.65	pairs...	opp....		cent....	cell-sheet...	sing...	Bosch.....	hand...
Saxon.....	400	895	96	pneu....	28x3	28x3	under hood..	4	2	2½x4	12.08	block...	left....		thermo..	cell-sheet...	sing...	Atw. Kent...	auto...
Selden.....T	2,000	1,700	126½*	solid....	34x3	34x3d	under hood..	4	3	3½x5	19.61	block...	left....		thermo..	sq-t-sheet...	sing...	Bosch.....	fixed...
Selden.....JC	4,000	2,000	150	solid....	36x4	36x4d	under hood..	4	3	3½x5½	22.50	block...	right...		cent....	sq-t-sheet...	sing...	Bosch.....	fixed...
Selden.....JWL	4,000	2,250	150*	solid....	36x4	36x4d*	under hood..	4	3	4½x5	27.20	block...	right...		cent....	sq-t-sheet...	sing...	Bosch.....	fixed...
Selden.....N	7,000	2,950	164	solid....	36x5	36x5d	under hood..	4	3	4½x5½	32.40	pairs...	left....		cent....	sq-t-sheet...	sing...	Eisemann....	fixed...
Service.....120	2,000	1,375	135	solid....	34x3	34x4	under hood..	4	3	3½x5½	19.61	block...	right...		thermo..	fin-sheet....	sing...	Bosch.....	hand...
Service.....QW	3,000	2,200	150	solid....	36x3½	36x5	under hood..	4	3	4½x5½	27.20	block...	right...		cent....	fin-sheet....	sing...	Eisemann....	hand...
Service.....PW	4,000	2,500	160*	solid....	36x4	36x4d	under hood..	4	3	4½x5½	27.20	block...	right...		cent....	fin-sheet....	sing...	Eisemann....	hand...
Service.....HW	7,000	3,000	171*	solid....	36x5	36x5d	under hood..	4	3	4½x6	32.40	block...	right...		cent....	fin-cast.....	dual...	Eisemann....	hand...
Service.....HX	10,000	4,000	171*	solid....	36x6	40x6d	under hood..	4	3	4½x6½	36.15	pairs...	left....		cent....	cell-sheet...	dual...	Eisemann....	hand...
Signal.....F	2,000	1,550	144*	solid....	34x3	36x4	under hood..	4	3	3½x5½	22.50	block...	left....		cent....	fin-cast.....	sing...	Eisemann....	fixed..
Signal.....H	3,000	1,750	144*	solid....	34x3½	36x5	under hood..	4	3	3½x5½	22.50	block...	left....		cent....	fin-cast.....	sing...	Eisemann....	fixed..
Signal.....J	4,000	2,100	150	solid....	34x4	36x4d	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	fin-cast.....	sing...	Eisemann....	fixed..
Signal.....M	7,000	3,000	168*	solid....	40x5	40x5d	under hood..	4	3	4½x5½	32.40	pairs...	left....		cent....	fin-cast.....	sing...	Eisemann....	fixed..
South Bend.....30	1,500	1,475	128*	pneu....	34x4½	34x4½	under hood..	4	3	3½x5	22.50	block...	left....		thermo..	cell-sheet...	dual...	Bosch.....	hand...
South Bend.....40	3,000	1,750	130*	solid....	36x3½	36x5	under hood..	4	3	4 x5	25.60	block...	left....		cent....	cell-sheet...	dual...	Bosch.....	hand...
South Bend.....40-2	4,000	2,000	142	solid....	36x4	36x3½d	under hood..	4	3	4 x5	25.60	block...	left....		cent....	cell-sheet...	dual...	Bosch.....	hand...
South Bend.....60	7,000	3,250	160*	solid....	36x6	36x5d	under hood..	4	3	4½x5½	36.15	pairs...	opp....		cent....	cell-sheet...	dual...	Bosch.....	hand...
Standard.....70	4,000	2,000	140	solid....	36x4	36x6	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	fin-sheet....	sing...	Eisemann....	auto..
Standard.....60	7,000	2,850	144*	solid....	36x5	36x5d	under hood..	4	3	4½x5½	32.40	pairs...	left....		cent....	fin-sheet....	sing...	Eisemann....	auto..
Standard.....40	8,000	3,025	144*	solid....	36x5	36x5d	under hood..	4	3	4½x5½	32.40	pairs...	left....		cent....	fin-sheet....	sing...	Eisemann....	auto..
Standard.....50	10,000	3,400	144*	solid....	36x5	40x6d	under hood..	4	3	4½x5½	29.00	pairs...	left....		cent....	fin-sheet....	sing...	Eisemann....	auto..
Standard Tractor.....B	12,000	3,250	72	solid....	36x5	36x5d	btw seats...	4	3	4½x6½	36.15	pairs...	left....		cent....	sq-t-sheet...	dual...	Bosch.....	hand...
Standard Tractor.....D	20,000	4,000	76	solid....	36x5	40x6d	btw seats...	4	3	4½x6½	36.15	pairs...	left....		cent....	sq-t-sheet...	dual...	Bosch.....	hand...
Stearns.....	10,000	3,800	144*	solid....	34x5	38x5d	under hood..	4	5	4½x5½	29.00	pairs...	sleeve..		cent....	cell-sheet...	dual...	Bosch.....	hand..
Stegeman.....	3,000	1,900	150	solid....	34x3½	36x5	under hood..	4	3	4½x5½	27.20	block...	.....		cent....	sq-t-sheet...	sing...	Eisemann....	auto..
Stegeman.....	5,000	2,500	144*	solid....	34x4	36x4d	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	sq-t-sheet...	sing...	Eisemann....	auto..
Stegeman.....Special	5,000	2,500	142*	solid....	40x4	40x6	under hood..	4	3	4½x5½	27.20	block...	left....		cent....	sq-t-sheet...	sing...	Eisemann....	auto..
Stegeman.....	7,000	.....	156	solid....	36x4	40x5d	under hood..	6	.....	3½x5½	33.75	threes..	left....		cent....	—cast.....	sing...	Eisemann....	auto..
Sterling.....	1,500	895	127	pneu....	34x4	34x4	under hood..	4	2	3½x4½	15.64	block...	right...		thermo..	fin-cast.....	sing...	Bosch.....	hand..
Sterling.....	4,000	2,800	148*	solid....	36x4	36x4d	under hood..	4	3	4 x5½	25.60	pairs...	right...		cent....	fin-cast.....	sing...	Eisemann....	auto..
Sterling.....	7,000	3,400	158*	solid....	36x4	36x5d	under hood..	4	3	4½x5½	29.00	pairs...	right...		cent....	fin-cast.....	sing...	Eisemann....	auto..
Sterling.....	10,000	4,500	178	solid....	36x6	40x6d	under hood..	4	3	4½x6½	32.40	pairs...	right...		cent....	fin-cast.....	dual...	Eisemann....	auto..
Sterling.....	10,000	4,500	178	solid....	36x6	40x6d	under hood..	4	3	4½x6½	32.40	pairs...	right...		cent....	fin-cast.....	dual...	Eisemann....	auto..
Sterling.....	14,000	4,750	178	solid....	36x6	40x7d	under hood..	4	3	4½x6½	36.15	pairs...	right...		cent....	fin-cast.....	dual...	Eisemann....	auto..
Stewart (B).....3	1,500	.....	118*	pneu....	34x4½	34x4½	under hood..	4	3	3½x5½	19.61	block...	right...		thermo..	cell-sheet...	sing...	Bosch.....	fixed...
Stewart (B).....4	2,500	.....	128	solid....	35x3½	35x4	under hood..	4	3	3½x5½	19.61	block...	right...		thermo..	cell-sheet...	sing...	Bosch.....	fixed...
Stewart (C).....A	2,000	700	96	solid....	36x3	36x3	under flr....	2	2	5 x5½	20.00	sing....	.....		cent....	cell-sheet...	dual...	Kingston.....	hand...
Studebaker.....SF	1,000	785	112	pneu....	34x4	34x4	under hood..	4	3	3½x5	24.22	block...	left....		cent....	fin-sheet....	sing...	battery.....	hand...
Studebaker.....7	2,000	.....	125	pneu....	35x5	35x5	under hood..	4	3	3½x5	24.22	block...	left....		cent....	fin-sheet....	sing...	battery.....	hand...

ABBREVIATIONS: General, *, *with other options;* opt, *optional.* **Price,** -c, *complete with body.* **Tires, Kind,** Pneu, *pneumatic;* Cush, *cushion;* p&s, *pneumatic in front and solid in rear;* s & st, *solid in front and steel in rear.* **Tire Sizes,** d, *dual.* **Motor Location,** btw seats, *between seats;* under flr, *under floor.* **Cylinders Cast,** sing, *singly or individually.* **Location of Valves,** opp, *opposite or T-head type;* top (two cylinder motors only), *L-head cylinder laid horizontal with valves up;* r & h, *at right and in head, L-head cylinder;* l & h, *at left and in head, L-head cylinder;* 2-cyc, *two cycle motor, no valve.* **Water Circulation,** cent, *centrifugal pump;* gear, *gear pump;* thermo, *thermo-syphon circulation;* air, *air-cooled, no water* **Radiator Type and Case,** fin-sheet, *finned-tube core with sheet metal casing;* fin-cast, *finned-tube core with cast aluminum casing;* sq-t-sheet, *square tube or flat tube core with sheet metal casing;* sq-t-cast, *square tube core with cast aluminum casing;* cell-sheet, *cellular or honeycomb core with sheet metal casing;* cell-cast, *cellular core with cast aluminum casing;* s-s-t-sheet, *zig-zag tube core with sheet metal casing;* s-s t-cast, *zig-zag tube core with cast aluminum casing;* ring-cast, *copper tube core arranged in a ring about a centrifugal fan with a cast aluminum casing.* **Ignition, Type,** sing, *single;* doub, *double.* **Make of Magneto** (or other sparking device), Atw. Kent, *Atwater Kent.* **Spark Advance,** auto, *automatic;* auto-h, *automatic advance with hand adjustment;* 2-pt, *two-point fixed, battery circuit fixed in retard, magneto in advance.*

Commercial Vehicles for 1916—Continued

MOTOR						TRANSMISSION								SPRINGS		CONTROL		
GOVERNOR		SPEED					GEARSET											
Type	Drive	Motor in r.p.m.	Truck in m.p.h.	Carbureter Make	Lubrication	Clutch Type	Type	Location	Speeds	Total Gear Reduction in High	Final Drive	Torque Taken By	Propulsion Taken By	Front	Rear	Steer	Levers	Name and Model
cent...	motor...	.....	.....	Stromberg...	splash....	cone...	selec...	amid.....	3	6.00 -1	top worm....	springs...	springs...	½-ell...	½-ell...	right...	right...	Peerless.....TC2
cent...	motor...	925	14½	Stromberg...	splash....	cone...	selec...	unit-j.....	4	7.45 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	right...	right...	Peerless.....TC3
cent...	motor...	.....	.....	Stromberg...	splash....	cone...	selec...	unit-j.....	4	8.70 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	right...	right...	Peerless.....TC4
cent...	motor...	.....	.....	Stromberg...	splash....	cone...	selec...	unit-j.....	4	10.50 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	right...	right...	Peerless.....TC5
cent...	motor...	.....	.....	Stromberg...	splash....	cone...	selec...	unit-j.....	4	10.50 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	right...	right...	Peerless.....TC6
cent...	motor...	1,050	16	Pierce-A....	pressure..	cone...	selec...	unit-m....	3	7.00 -1	top worm....	tor-arm...	rad-rd...	½-ell...	½-ell...	right...	right...	Pierce-Arrow.....
cent...	motor...	950	14	Pierce-A....	pressure..	cone...	selec...	amid.....	3	7.80 -1	top worm....	tor-arm...	rad-rd...	½-ell...	½-ell...	right...	right...	Pierce-Arrow.....
none...	none...	.....	22	Johnson....	circ-spl...	dry-d...	selec...	amid.....	3	4.00 -1	bevel.....	tor-arm...	springs...	½-ell...	½-ell...	left....	cent...	Reo.....F
hyd....	motor...	1,200	15	Johnson....	circ-spl...	dry-d...	selec...	amid.....	3	8.70 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	left....	cent...	Reo.....J
suct...	motor...	1,200	18	Stromberg...	spl-press..	dry-d...	selec...	unit-m....	3	7.00 -1	int-gear.....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Republic.....F
suct...	motor...	1,000	15	Stromberg...	spl-press..	dry-d...	selec...	unit-m....	3	7.00 -1	int-gear.....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Republic.....E
suct...	motor...	1,100	13	Stromberg...	spl-press..	dry-d...	selec...	unit-m....	3	9.00 -1	int-gear.....	springs...	springs...	½-ell...	½-ell...	left....	.....	Republic.....A
.....	.....	1,100	11	Stromberg.	spl-press..	dry-d...	selec...	unit-m....	4	11.00 -1	int-gear.....	springs...	springs...	½-ell...	½-ell...	left....	.....	Republic.....T
cent...	motor...	1,200	.....	.....	.....	dry-d...	selec...	unit-m....	4	.....	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Rowe.....CW
cent...	motor...	1,100	.....	Rayfield....	pressure..	dry-d...	selec...	unit-m....	4	.....	top worm....	springs...	springs...	½-ell...	½-ell...	left....	c & l...	Rowe.....CDW
cent...	motor...	1,000	.....	Rayfield....	pressure..	.....	selec...	amid.....	4	.....	top worm....	springs...	rad-rd...	½-ell...	½-ell...	left....	cent...	Rowe.....DFW
cent...	motor...	.....	.....	.....	pressure..	wet-d...	selec...	amid.....	.....	.....	top worm....	springs...	rad-rd...	½-ell...	½-ell...	left....	cent...	Rowe.....TW
suct...	motor...	900	15	Stromberg...	pressure..	wet-d...	ind-c...	amid.....	3	.....	top worm....	springs...	springs...	½-ell...	½-ell...	right...	right...	Royal.....A
suct...	motor...	900	12	Stromberg...	pressure..	wet-d...	ind-c...	amid*....	3	.....	top worm*...	springs...	springs*.	½-ell...	½-ell...	right...	right...	Royal.....A
suct...	motor...	900	10	Stromberg...	pressure..	wet-d...	ind-c...	unit-j....	3	.....	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	right...	right...	Royal.....A
none...	none....	3,200	35	Schebler....	splash....	wet-d...	prog...	amid.....	3	11.32 -1	sing chn.....	.....	sub-f...	½-ell...	ellip...	cent...	cent...	R-S.....
cent...	d-shaft..	1,200	16	Zenith.....	pressure..	wet-d...	selec .	unit-m....	3	7.00 -1	top worm....	springs...	springs...	½-ell...	½-ell...	left*...	cent...	Salvador.....
suct...	motor...	1,000	20	Stromberg...	circ-spl...	dry-d...	selec...	unit-m....	3	7.75 -1	top worm....	springs...	springs...	½-ell...	½-ell...	right...	cent...	Sandow.....
suct...	motor...	1,000	18	Stromberg...	circ-spl...	dry-d...	selec...	unit-m....	3	7.00 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	right...	cent...	Sandow.....
suct...	motor...	1,000	18	Stromberg...	circ-spl...	dry-d...	selec...	unit-m....	3	7.75 -1	top worm..	springs...	springs...	½-ell...	½-ell...	right...	cent...	Sandow.....
suct...	motor...	1,000	12	Stromberg...	circ-spl...	dry-d...	selec...	unit-m....	3	7.00 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	right...	cent...	Sandow.....
suct...	motor...	1,000	12	Stromberg...	circ-spl...	dry-d...	selec...	unit-m....	3	9.45 -1	top worm....	springs...	springs...	½-ell...	½-ell...	right...	cent...	Sandow.....
none...	none....	1,500	18	Schebler....	circ-spl...	dry-d...	selec...	unit-m....	3	6.83 -1	int-gear.....	springs...	springs...	½-ell...	½-ell...	left....	.....	Sanford.....O
none.	none..	1,500	18	Schebler....	circ-spl...	dry-d...	selec...	unit-m....	3	.....	int-gear.....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Sanford.....P
cent...	motor...	1,500	14	Schebler....	circ-spl...	dry-d...	selec...	unit-m....	3	8.99 -1	int-gear*...	springs*.	springs*.	½-ell...	½-ell...	left....	cent...	Sanford.....M
cent...	motor...	1,000	12½	Saurer.....	spl-press.	cone...	selec...	unit-j.....	4	10.00 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	right...	right...	Saurer.....
cent...	motor...	1,000	9½	Saurer.....	spl-press.	cone...	selec...	unit-j.....	4	13.50 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	right...	right...	Saurer.....
none...	none....	2,000	47	Mayer.....	circ-spl...	dry-d...	prog...	unit-x.....	3	3.50 -1	bevel.....	tor-t.....	tor-t.....	cant..	cant..	left....	cent...	Saxon.....
cent...	motor...	1,130	17	Stromberg...	circ-spl...	dry-d...	selec...	unit-m....	3	6.75 -1	top worm....	springs...	springs...	½-ell...	½-ell...	left*...	cent...	Selden.....T
cent...	motor...	1,146	13	Stromberg...	circ-spl...	dry-d...	selec...	unit-m....	3	9.45 -1	int-gear.....	springs...	springs...	½-ell...	½-ell...	left*...	cent...	Selden.....JC
cent...	motor...	1,150	13	Stromberg...	circ-spl...	dry-d...	selec...	unit-m....	3	9.25 -1	top worm....	springs...	springs...	½-ell...	½-ell...	left*...	cent...	Selden.....JWL
cent...	motor...	1,250	13	Stromberg...	circ-spl...	dry-d...	selec...	unit-m....	4	10.33 -1	top worm....	springs...	rad-rd...	½-ell...	½-ell...	right...	cent...	Selden.....N
none...	none....	1,200	18	Stromberg..	spl-press.	dry-d...	selec...	unit-m....	3	6.70 -1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Service.....120
cent...	motor...	1,000	14	Stromberg...	spl-press.	dry-p...	selec...	amid.....	3	7.75 -1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Service.....QW
cent...	motor...	870	12	Stromberg...	spl-press.	dry-p...	selec...	amid.....	3	7.75 -1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Service.....PW
cent...	motor...	900	11	Stromberg...	pressure	dry-p...	selec...	amid.....	4	8.75 -1	top worm....	springs...	rad-rd...	½-ell...	½-ell...	left....	cent...	Service.....HW
cent...	motor...	900	10	Stromberg...	spl-press.	cone...	selec...	unit-j.....	4	9.00 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	left....	cent...	Service.....HX
suct...	motor...	1,200	15	Stromberg...	spl-press..	dry-d...	selec...	unit-m....	3	7.75 -1	top worm....	springs...	springs...	½-ell...	½-ell...	left*...	cent...	Signal.....F
suct...	motor...	1,295	15	Stromberg...	spl-press..	dry-d...	selec...	unit-m....	3	9.25 -1	top worm....	springs...	springs...	½-ell...	½-ell...	left*...	cent...	Signal.....H
suct...	motor...	1,295	15	Stromberg...	spl-press..	dry-d...	selec...	unit-m....	3	9.25 -1	top worm....	springs...	springs...	½-ell...	½-ell...	left*...	cent...	Signal.....J
suct...	motor...	1,300	15	Stromberg...	spl-press..	dry-d...	selec...	unit-m....	3	10.33 -1	top worm....	springs...	rad-rd...	½-ell...	½-ell...	left*...	cent...	Signal.....M
none...	none....	1,800	25	Stromberg...	circ-spl...	wet-d...	selec...	unit-m....	3	6.50 -1	top worm....	springs...	springs...	½-ell...	½-ell...	right...	.....	South Bend.....30
none...	none....	1,800	25	Stromberg...	circ-spl...	wet-d...	selec...	unit-m....	3	8.50 -1	top worm*...	springs...	springs*.	½-ell...	½-ell...	right...	.....	South Bend.....40
none...	none....	1,800	22	Stromberg...	circ-spl...	wet-d...	selec...	unit-m....	3	8.50 -1	top worm*...	springs...	springs...	½-ell...	½-ell...	right...	.....	South Bend.....40-2
suct...	f-wheel..	1,800	15	Stromberg...	circ-spl...	wet-d...	selec...	amid.....	3	11.50 -1	top worm....	springs...	springs...	½-ell...	½-ell...	right...	.....	South Bend.....60
suct...	motor...	1,100	15	Schebler....	circ-spl...	cone...	selec...	amid.....	3	7.75 -1	top worm....	springs...	rad-rd...	½-ell...	½-ell...	left....	cent...	Standard.....70
suct...	motor...	1,050	12	Stromberg...	circ-spl...	dry-d...	selec	unit-m....	3	10 33 -1	top worm..	springs.	rad-rd..	½-ell...	½-ell...	left.	cent...	Standard.....60
suct...	motor...	1,050	12	Stromberg...	circ-spl...	dry-d...	selec...	unit-m....	3	9.50 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	left....	cent...	Standard.....40
suct...	motor...	1,050	9	Stromberg...	circ-spl...	dry-d...	selec...	unit-m....	3	13.00 -1	top worm....	tor-arm...	rad-rd...	½-ell...	½-ell...	left....	cent...	Standard.....50
none...	none....	1,000	12	Holley.....	circ-spl...	dry-p...	ind-c...	amid.....	3	9.00 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	right...	right...	Standard Tractor.....B
none...	none....	1,000	6½	Holley.....	circ-spl...	dry-p...	ind-c...	amid.....	3	18.00 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	right...	right...	Standard Tractor.....D
none...	none....	1,000	12	Stromberg...	spl-press..	dry-d...	selec...	amid.....	4	9.00 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	left....	cent...	Stearns.....
cent...	motor...	1,100	18	Stromberg...	spl-press..	dry-d...	selec...	unit-m....	3	.....	top worm*...	springs...	springs*.	½-ell...	½-ell...	left....	c & l...	Stegeman.....
cent...	motor...	1,100	15	Stromberg...	spl-press..	dry-d...	selec...	unit-m....	3	.....	top worm*...	springs...	springs*.	½-ell...	½-ell...	left....	c & l...	Stegeman.....
cent...	motor...	1,100	15	Stromberg.	spl-press..	dry-d...	selec...	unit-m....	3	.....	top worm*...	springs...	springs*.	½-ell...	½-ell...	left....	c & l...	Stegeman.....Special
cent...	motor...	1,100	12	Stromberg...	spl-press..	dry-d...	selec...	unit-m....	3	10.33 -1	top worm*...	springs...	springs*.	½-ell...	½-ell...	left....	c & l...	Stegeman.....
none...	none....	1,333	20	Schebler....	circ-spl...	dry-d...	prog...	unit-m....	3	7.00 -1	top worm....	springs...	springs...	½-ell...	½-ell	left....	cent...	Sterling.....
cent...	motor...	1,040	14½	Holley.....	circ-spl...	dry-d...	selec...	unit-m....	3	7.70 -1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Sterling.....
cent...	motor...	1,040	13	Holley.....	circ-spl...	dry-d...	selec...	unit-m....	3	8.75 -1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Sterling.....
cent...	motor...	975	10	Holley.....	circ-spl...	dry-d...	selec...	unit-m....	4	11.20 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	left....	cent...	Sterling.....
cent...	motor...	975	10	Holley.....	circ-spl...	dry-d...	selec...	unit-m....	4	11.75 -1	top worm....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Sterling.....
cent...	motor...	975	10	Holley.....	circ-spl...	dry-d...	selec...	unit-m....	4	11.20 -1	dbl chn.....	tor-arm...	rad-rd...	½-ell...	½-ell...	left....	cent...	Sterling.....
none...	none....	1,500	25	Zenith.....	circ spl...	dry-d...	selec...	unit m....	3	6.00 -1	int-gear.....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Stewart (B).....3
none...	none....	1,500	20	Zenith.....	circ spl...	dry-d...	selec...	unit-m....	3	7.00 -1	int-gear.....	springs...	springs...	½-ell...	½-ell...	left....	cent...	Stewart (B).....4
none...	none....	.....	18	Schebler....	pressure..	dry-p...	plan...	unit-m....	2	7.00 -1	dbl chn.....	.....	rad-rd...	½-ell...	½-ell...	left....	cent...	Stewart (C).....A
none...	none....	.....	.....	Schebler....	circ-spl...	cone...	selec...	unit-x.....	3	4.58 -1	bevel.....	tor-arm...	rad-rd...	½-ell...	½-ell...	left....	cent...	Studebaker.....SF
cent...	f-wheel..	960	20	Schebler....	circ-spl...	cone...	selec...	unit-x.....	3	5.00 -1	bevel.....	tor-arm...	rad-rd...	½-ell...	½-ell...	left....	cent...	Studebaker.....7

ABBREVIATIONS: (continued). **Governor Type,** cent, *centrifugal;* l-b, *loose-ball;* suct, *suction;* hyd, *hydraulic;* elec, *electric.* **Governor Drive,** motor, *from motor;* d-shaft, *from driving shaft;* f-wheel, *from front wheel;* duplex, *from both the motor and driving shaft by overrunning clutches.* **Lubrication,** splash, *non-circulating or simple splash;* circ-spl, *circulating splash;* spl-press, *splash-pressure;* fuel-inj, *fuel injection, oil mixed with fuel;* pressure, *pressure feed, no splash.* **Clutch Type,** dry-p, *dry plate;* dry-d, *dry multiple disk;* wet-d, *wet disk or disk-in-oil;* wet-p, *wet plate or plate-in-oil;* r-cone, *reversed cone or inverted cone;* cont-b, *contracting band;* exp-s, *expanding shoe.* **Gearset Type,** prog, *progressive sliding gear;* selec, *selective sliding gear;* plan, *planetary;* ind-c, *constant-mesh, individual-clutch;* fric, *friction;* elec, *electric.* **Gearset Location,** amid, *amidships;* unit-m, *unit with motor;* unit-j, *unit with jackshaft;* unit-x, *unit with axle.* **Gearset Speeds,** inf, *infinite number.* **Final Drive,** int-g, int-gear, *internal-gear;* sing chn, *single chain;* dbl chn, *double chain;* doub-red, *double reduction;* spur g, *spur gears;* sp-bev, *spiral bevel;* f, *front wheel or wheels;* 4, *four-wheel driven.* **Torque Taken By,** rad-rd, *radius rods;* tor-arm, *torque arm;* tor-t, *torsion tube;* sub-f, *sub-frame.* **Propulsion Taken By,** rad-rd, *radius rod;* tor-t, *torsion tube;* tor-arm, *torque arm;* sub-f, *sub-frame.* **Springs,** ellip, *elliptic;* ½-ell, *half elliptic;* ¼-ell, *quarter elliptic;* ¾-ell, *three-quarters elliptic;* plat, *platform;* cant, *cantilever.* **Control Levers** cent, *center;* c & r, *gearshift center, brake right;* c & l, *gearshift center, brake left.*

Technical Specifications of Gasoline

Name and Model	Capacity in Pounds	Price of Chassis	Wheelbase in Inches	TIRES			MOTOR												
				Kind	SIZES IN INCHES		Location	No. of Cylinders	No. of Crankshaft Bearings	Bore and Stroke	N.A.C.C. Hp.	Cylinders Cast	Valves Placed	COOLING		IGNITION		
					Front	Rear								Water Circulation	Radiator Core and Case	Type	Make	Spark Advance
Sullivan....G	3,000	1,600	129	solid	36x3	36x4	under hood	4	.....	3½x4½	22.50	block	r & h	thermo	fin-sheet	sing	Bosch	fixed
Sullivan....E	4,000	2,250	150	solid	36x4	36x6	under hood	4	3	4½x5½	27.20	block	r & h	cent	fin-sheet	sing	Bosch	fixed
Superior....A	2,000	1,350	124	solid*	34x3½*	34x4*	under hood	4	3	3½x5	19.61	block	head	thermo	cell-sheet	sing	Eisemann	fixed
Superior....C	4,000	1,800	144	solid	36x4	36x6	under hood	4	3	3½x5	22.50	block	head	cent	cell-sheet	sing	Eisemann	fixed
Tiffin....A-AC	1,500	1,400*	112	solid	34x3	34x3	under hood	4	3	3½x5	19.61	block	right	thermo	fin-sheet	sing	Bosch	hand
Tiffin....AI	2,000	1,600	112	solid	34x3	34x4	under hood	4	3	3½x5	19.61	block	right	thermo	fin-sheet	sing	Bosch	hand
Tiffin....GI-GC	3,000	1,800*	128	solid	36x3½	36x5	under hood	4	3	3½x5½	22.50	block	left	cent	fin-sheet	sing	Bosch	hand
Tiffin....MW-MC	4,000	2,600*	140	solid	36x4	36x3½d	under hood	4	3	4½x5½	27.20	block	left	cent	fin-sheet	sing	Bosch	hand
Tiffin....RW-R	10,000	4,250*	168	solid	36x5	42x5d	under hood	6	3	3½x5½	33.75	threes	right	cent	fin-sheet	sing	Bosch	hand
Tiffin....SW-S	12,000	4,550*	168	solid	36x6	42x6d	under flr	6	3	3½x5½	33.75	threes	right	cent	fin-sheet	sing	Bosch	hand
Tower	4,000	1,600	135	solid	34x3½	34x3½d	under hood	4	.....	3½x5	19.61	block	left	thermo	sq-t-sheet	sing	Bosch	hand
Transit....E	2,000	2,000	130	solid	36x3½	36x3½d	under flr	4	3	4½x5½	32.40	pairs	left	cent	sq-t-sheet	sing	Bosch	hand
Transit....F	4,000	2,850	144	solid	36x4	36x4d	btw seats	4	3	4½x5½	32.40	pairs	left	cent	sq-t-sheet	sing	Bosch	hand
Transit....T	7,000	3,500	144*	solid	36x5	36x5d	btw seats	4	3	4½x5½	32.40	pairs	left	cent	sq-t-sheet	sing	Bosch	hand
Transit....V	10,000	4,500	144*	solid	36x6	40x6d	btw seats	4	3	4½x5½	32.40	pairs	left	cent	sq-t-sheet	sing	Bosch	hand
Transport Tractor....T	10,000	2,500	80	solid	34x4	34x3½d	btw seats	4	3	3½x5½	19.61	block	right	thermo	cell-sheet	sing	Bosch	fixed
Trumbull....16D	500	340	80*	pneu	28x3	28x3	under hood	4	2	2½x4	13.37	block	right	thermo	fin-sheet	sing	Splitdorf	hand
Twin City	2,000	1,350	104*	solid	34x3	36x3½	under seats	2	2	5 x5	20.00	sing	opp	thermo	fin-sheet	sing	K.-W	hand
Twin City	4,000	1,500	104*	solid	34x3	36x3½	under seats	4	5	3½x5	19.61	block	left	thermo	fin-sheet	sing	K.-W	hand
Universal....G	3,000	1,950	130*	solid	34x3½	34x5	under hood	4	3	3½x5½	22.50	block	right	gear	fin-cast	sing	Eisemann	hand
Universal....D	4,000	2,800	132*	solid	36x4	36x4d	under flr	4	3	4 x5½	25.60	pairs	opp	cent	cell-sheet	dual	Eisemann	hand
Universal....A	6,000	3,400	132*	solid	36x5	36x4d	under flr	4	3	4 x5½	25.60	pairs	opp	cent	cell-sheet	dual		hand
United....AG	3,000	.....	144	solid*	34x3½	34x5	under hood	4	.....	3½x5	22.50	block	right	cent	sq-t-sheet	sing	Eisemann	fixed
United....BSW	4,000	2,250	144*	solid	36x4	36x4d	under hood	4	3	4½x5	27.20	block	left	cent	sq-t-sheet	sing	Eisemann	fixed
United....CSW	7,000	2,900	144*	solid	36x5	36x5d	under hood	4	3	4½x5½	32.40	pairs	left	cent	sq-t-sheet	sing	Eisemann	fixed
United....ESW	10,000	3,500	144*	solid	36x6	40x6d	under hood	4	3	5 1/16x5½	41.61	pairs	opp	cent	sq-t-sheet	sing	Eisemann	fixed
U. S....H	4,000	2,700	138	solid	34x4	36x4d	under hood	4	3	4½x5½	27.20	block	left	cent	sq-t-sheet	dual	Bosch	hand
U. S....J	7,000	3,400	162	solid	36x5	40x5d	under hood	4	3	4½x5	32.40	pairs	left	cent	sq-t-sheet	dual	Bosch	hand
U. S....K	10,000	4,200	168	solid	36x5	40x6d	under hood	4	3	4½x5	32.40	pairs	left	cent	sq-t-sheet	dual	Bosch	hand
Velie....25	3,000	2,250	150	solid	36x4	36x5	under hood	4	3	4½x5½	27.20	block	left	cent	fin-cast	sing	Bosch	hand
Velie....26	7,000	3,350	172	solid	36x5	40x5d	under hood	4	3	4½x5½	32.40	pairs	left	cent	fin-cast	sing	Bosch	hand
Vim....18	1,000	620	100	pneu	31x4	31x4	under hood	4	3	3 x4½	14.40	block	right	thermo	fin-sheet	sing	Dixie	hand
Voltz....C	6,000	2,750	142	solid	36x5	38x5d	under hood	4	3	4½x5½	32.40	pairs	left	cent	cell-sheet	dual	Eisemann	auto
Voltz....T	10,000	3,600	142	solid	36x6	40x6d	under hood	4	3	5 x5½	40.00	pairs	opp	cent	cell-sheet	dual	Eisemann	auto
Vulcan	4,000	2,750	150*	solid	36x4	34x3½d	under hood	4	3	4½x5½	30.00	pairs	left	thermo	sq-t-cast	dual	Remy	hand
Vulcan	6,000	3,250	156*	solid	36x5	34x4d	under hood	4	3	4½x5½	30.00	pairs	left	thermo	sq-t-cast	dual	Remy	hand
Vulcan	10,000	4,500	165*	solid	36x6	36x6d	under hood	4	3	4½x5½	30.00	pairs	left	thermo	sq-t-cast	dual	Remy	hand
Walter	10,000	4,750	144*	solid*	40x6	40x5d	under hood	4	3	4½x6	30.65	block	right	cent	fin-sheet	sing	Eisemann	auto
Walter	12,000	5,000	144*	solid	40x6	40x6d	under hood	4	3	4½x6	30.65	block	right	cent	fin-sheet	sing	Eisemann	auto
Walter	15,000	5,250	144*	solid	40x6	40x6d	under hood	4	3	4½x6	30.65	block	right	cent	fin-sheet	sing	Eisemann	auto
Walter....Tractor	24,000	5,000	108*	solid	40x4d	40x4d	under hood	4	3	4½x6	30.65	block	right	cent	fin-sheet	sing	Eisemann	auto
Watson	10,000	.....	158	s & st	40x4d	53x5	under hood	4	3	4½x6	30.65	block	right	cent	fin-sheet	sing	Eisemann	auto
White....GBBE	1,500	2,100	133½	pneu	34x4½	34x4½	under hood	4	2	3½x5½	22.50	block	right	cent	sq-t-sheet	sing	Bosch	hand
White....TBC	3,000	3,000	145½	pneu	36x4½	36x4½d	under hood	4	2	3½x5½	22.50	block	right	cent	sq-t-sheet	sing	Bosch	hand
White....TAD	6,000	3,700	163	solid	36x5	40x5d	under hood	4	2	3½x5½	22.50	block	right	cent	sq-t-sheet	sing	Bosch	hand
White....TCD	10,000	4,500	169	solid	36x5	40x6d	under hood	4	3	4½x6½	29.00	block	right	cent	sq-t-sheet	sing	Bosch	hand
Wichita....A	2,000	1,650	110*	solid	34x3	34x4	under hood	4	2	3½x5	16.92	block	left	thermo	cell-sheet	sing	Dixie	hand
Wichita....K	2,000	1,650	118*	solid	36x3	36x4	under hood	4	2	3½x5	19.61	block	left	thermo	cell-sheet	sing	Dixie	hand
Wichita....L	3,000	1,800	118*	solid	36x3	36x5	under hood	4	2	3½x5	19.61	block	left	thermo	cell-sheet	sing	Dixie	hand
Wichita....B	4,000	2,100	118*	solid	34x3½	34x3d	under hood	4	2	3½x5	19.61	block	left	thermo	cell-sheet	sing	Dixie	hand
Wichita....M	4,000	2,100	118*	solid	36x3½	36x3*	under hood	4	2	3½x5	19.61	block	left	thermo	cell-sheet	sing	Dixie	hand
Wichita....O	7,000	3,250	165	solid	36x5	36x5d	under hood	4	3	4½x5½	29.00	pairs	left	cent	cell-sheet	sing	Dixie	hand
Wilcox....T	1,000	1,000	115	pneu	34x4	34x4	under hood	4	3	3½x5	19.61	block	left	thermo	fin-sheet	sing	Bosch	hand
Wilcox....N	1,500	1,200	120	pneu	35x4½	35x4½	under hood	4	3	3½x5	19.61	block	left	thermo	fin-sheet	sing	Bosch	hand
Wilcox....S	2,000	1,600	128	pneu*	35x5*	35x5*	under hood	4	3	3½x5	22.50	block	left	.....	fin-sheet	sing	Bosch	hand
Wilcox....R	3,000	1,800	134	solid	36x4	36x5	under hood	4	3	4½x5	29.00	pairs	right	cent	fin-sheet	sing	Bosch	hand
Witt-Will....WD1	2,240	.....	120	solid	36x3	36x4	under hood	4	3	3½x5½	22.50	block	left	cent	fin-sheet	sing	Eisemann	auto
Witt-Will....WD2	4,480	2,250	144	solid	36x3½	36x3½d	under hood	4	3	4½x5½	27.20	block	left	cent	fin-sheet	sing	Eisemann	auto

Received Too Late to Classify

Acason	4,000	2,350	150	solid	34x3½	36x3½d	under hood	4	3	4½x5½	29.00	pairs	left	cent	fin-cast	sing	Dixie	hand
Acason	7,000	3,000	170	solid	36x4	36x5d	under hood	4	3	4½x5½	29.00	pairs	left	cent	fin-cast	sing	Dixie	hand
Mogul....LM	3,000	1,600	125*	solid	36x4	36x5	under hood	4	.....	3½x5½	22.50	block	left	cent	cell-cast	sing	Bosch	fixed
Mogul....LW	4,000	2,000	138*	solid	36x5	38x4d	under hood	4	.....	4½x5½	27.20	block	left	cent	cell-cast	sing	Bosch	fixed
Mogul....L	5,000	2,250	138*	solid	36x5	38x4d	under hood	4	.....	4½x5½	27.20	block	left	cent	cell-cast	sing	Bosch	fixed
Mogul....T	7,000	2,550	165*	solid	36x5	36x5d	under hood	4	.....	4½x5½	32.40	pairs	left	cent	cell-sheet	sing	Bosch	fixed
Phoeni: Centiped	.....	.....	.....	steel	.....	.....	creeper	under hood	4	5	5½x7	48.48	single	r & h	cent	sq-t-sheet	sing	Swiss	hand
Wilson....E	4,000	2,000	144	solid	36x4	36x4d	under hood	4	.....	4½x5½	27.20	block	.....	cent	fin-.—.	sing	.....	fixed

ABBREVIATIONS: General *, *with other options;* opt, *optional.* **Price,** -c, *complete with body.* **Tires, Kind,** Pneu, *pneumatic;* Cush, *cushion;* p&s, *pneumatic in front and solid in rear;* s & st, *solid in front and steel in rear.* **Tire Sizes,** d, *dual.* **Motor Location,** btw seats, *between seats;* under flr, *under floor.* **Cylinders Cast,** sing, *singly or individually.* **Location of Valves,** opp, *opposite or T-head type;* top (two-cylinder motors only), *L-head cylinder laid horizontal with valves up;* r & h, *at right and in head, L-head cylinder;* l & h, *at left and in head, L-head cylinder;* 2-cyc, *two-cycle motor, no valves.* **Water Circulation,** cent, *centrifugal pump;* gear, *gear pump;* thermo, *thermo-syphon circulation;* air, *air-cooled, no water.* **Radiator Type and Case,** fin-sheet, *finned-tube core with sheet metal casing;* fin-cast, *finned-tube core with cast aluminum casing;* sq-t-sheet, *square tube or flat tube core with sheet metal casing;* sq-t-cast, *square tube core with cast aluminum casing;* cell-sheet, *cellular or honeycomb core with sheet metal casing;* cell-cast, *cellular core with cast aluminum casing;* z-z-t-sheet, *zig-zag tube core with sheet metal casing;* z-z-t-cast, *zig-zag tube core with cast aluminum casing;* ring-cast, *copper tube core arranged in a ring about a centrifugal fan with a cast aluminum casing.* **Ignition, Type,** sing, *single;* doub, *double.* **Make of Magneto** (or other sparking device), Atw. Kent, *Atwater Kent.* **Spark Advance,** auto, *automatic;* auto-h, *automatic advance with hand adjustment;* 2-pt, *two-point fixed, battery circuit fixed in retard, magneto in advance.*

Commercial Vehicles for 1916—Continued

MOTOR							TRANSMISSION								SPRINGS		CONTROL		
GOVERNOR		SPEED		Carbureter Make	Lubrication	Clutch Type	GEARSET			Total Gear Reduction in High	Final Drive	Torque Taken By	Propulsion Taken By		Front	Rear	Steer	Levers	Name and Model
Type	Drive	Motor in r.p.m.	Truck in m.p.h.				Type	Location	Speeds										
.....	.....	.....	.....	Holley	spl-press	cone	selec	unit-j	3	.....	dbl chn	.....	rad-rd		½-ell	plat	left	cent	Sullivan G
.....	.....	.....	.....	Holley	spl-press	dry-p	selec	unit-m	3	.....	top worm	springs	springs		½-ell	½-ell	left	cent	Sullivan E
suct	motor	1,200	17	Stromberg	circ-spl	dry-d	selec	unit-m	3	7.00 –1	int-gear	springs	springs		½-ell	½-ell	left	cent	Superior A
suct	motor	1,100	15	Stromberg	circ-spl	dry-d	selec	unit-m	3	7.75 –1	int-gear	springs	springs		½-ell	½-ell	left	cent	Superior C
cent	motor	1,000	15½	Schebler	spl-press	cone	selec	unit-m*	3	9.60 –1	int-gear*	tor-arm	rad-rd		½-ell	½-ell	left	cent	Tiffin A-AC
cent	motor	1,000	15	Schebler	spl-press	cone	selec	unit-m	3	9.60 –1	int-gear	tor-arm	rad-rd		½-ell	½-ell	left	cent	Tiffin AI
cent	motor	1,000	13½	Schebler	spl-press	cone	selec	unit-m*	3	8.00 –1	int-gear*	tor-arm	rad-rd		½-ell	½-ell	left	cent	Tiffin GI-GC
cent	motor	1,000	12	Schebler	spl-press	cone	selec	amid*	3	8.80 –1	top worm*	tor-arm	rad-rd		½-ell	½-ell	left	cent	Tiffin MW-MC
cent	motor	1,000	10	Schebler	spl-press	dry-p	selec	amid*	4	12.20 –1	top worm*	tor-arm	rad-rd		½-ell	½-ell	left	cent	Tiffin RW-R
cent	motor	1,000	10	Schebler	spl-press	dry-p	selec	amid*	4	12.20 –1	top worm*	tor-arm	rad-rd		½-ell	½-ell	left	cent	Tiffin SW-S
.....	.....	1,200	15	Stromberg	circ-spl	dry-d	selec	unit-m	3	8.75 –1	top worm	springs	springs		½-ell	½-ell	left	cent	Tower
cent	motor	1,200	16	Rayfield	circ-spl	wet-d	selec	unit-j	3	7.50 –1	dbl chn	.....	rad-rd		½-ell	½-ell	right	right	Transit E
cent	motor	1,200	14	Rayfield	circ-spl	wet-d	selec	unit-j	3	9.00 –1	dbl chn	.....	rad-rd		½-ell	½-ell	right	right	Transit F
cent	motor	1,200	12	Rayfield	circ-spl	wet-d	selec	unit-j	3	10.00 –1	dbl chn	.....	rad-rd		½-ell	½-ell	right	right	Transit T
cent	motor	1,200	10	Rayfield	circ-spl	wet-d	ind-c	unit-j	3	13.00 –1	dbl chn	.....	rad-rd		½-ell	½-ell	right	right	Transit V
cent	d-shaft	1,300	10	Zenith	circ-spl	dry-d	selec	unit-m	3	13.60 –1	top worm	springs	springs		½-ell	½-ell	left	cent	Transport Tractor T
none	none	2,200	45	Zephyr	circ-spl	dry-d	selec	unit-x	3	3.60 –1	bevel	tor-t	tor-t		½-ell	cant	left*	cent	Trumbull 16D
.....	.....	1,500	15	Schebler	circ-spl	dry-d	plan	unit-j	2	10.00 –1	dbl chn	.....	rad-rd		½-ell	½-ell	right	right	Twin City
.....	.....	1,500	15	Schebler	circ-spl	dry-d	prog	unit-j	3	10.00 –1	dbl chn	.....	rad-rd		½-ell	½-ell	right	right	Twin City
cent	motor	1,160	15	opt	circ-spl	dry-p	selec	unit-m	3	7.83 –1	top worm	tor-arm	rad-rd		½-ell	½-ell	left	cent	Universal G
l-b	motor	1,123	13	.....	circ-spl	cone	selec	amid	3	9.25 –1	dbl chn	.....	rad-rd		½-ell	½-ell	left	.....	Universal D
cent	motor	1,057	10½	opt	circ-spl	cone	selec	unit-j	3	10.33 –1	dbl chn	.....	rad-rd		½-ell	½-ell	left	.....	Universal A
suct	motor	.....	18	Stromberg	spl-press	dry-d	selec	unit-m	3	.....	top worm	springs	springs		½-ell	½-ell	left	cent	United AG
suct	motor	1,500	15	Stromberg	spl-press	dry-d	selec	unit-m	3	8.75 –1	top worm	springs	springs		½-ell	½-ell	left*	cent	United BSW
suct	motor	1,600	12	Stromberg	spl-press	dry-d	selec	unit-m	3	8.75 –1	top worm	springs	springs		½-ell	½-ell	left*	cent	United CSW
cent	d-shaft	1,800	10	Stromberg	spl-press	dry-d	selec	amid	4	11.75 –1	top worm	springs	springs		½-ell	½-ell	right	right	United ESW
cent	motor	1,200	15	Stromberg	circ-spl	cone	ind-c	amid	3	8.66 –1	top worm	springs	springs		½-ell	½-ell	left*	cent	U. S H
cent	motor	1,170	12	Stromberg	circ-spl	cone	ind-c	amid	3	11.70 –1	top worm	springs	springs		½-ell	½-ell	left*	cent	U. S J
cent	motor	1,196	11	Stromberg	circ-spl	cone	ind-c	amid	3	13.00 –1	top worm	springs	springs		½-ell	½-ell	left*	cent	U. S K
cent	motor	1,000	18	Stromberg	spl-press	dry-d	selec	amid	4	6.80 –1	top worm	springs	springs		½-ell	½-ell	right	right	Velie 25
cent	motor	1,100	14	Stromberg	spl-press	dry-d	selec	amid	4	10.30 –1	top worm	tor-arm	rad-rd		½-ell	½-ell	right	right	Velie 26
none	none	1,230	25	Stromberg	spl-press	cone	selec	unit-m	3	4.50– 1	bevel	springs	springs		½-ell	½-ell	left	cent	Vim 18
cent	motor	1,000	15	Rayfield	circ-spl	wet-d	selec	unit-j	3	6.60 –1	dbl chn	.....	rad-rd		plat	plat	left	cent	Voltz C
cent	motor	1,000	13	Rayfield	circ-spl	wet-d	selec	unit j	3	7.59 –1	dbl chn	.....	rad rd		plat	plat	left	cent	Voltz T
cent	motor	1,200	15½	Stromberg	circ spl	cone	selec	unit j	3	7.87 –1	dbl chn	.....	rad rd		½-ell	½-ell	right	right	Vulcan
cent	motor	1,200	15½	Stromberg	circ-spl	cone	selec	unit-j	3	7.87 –1	dbl chn	.....	rad-rd		½-ell	½-ell	right	right	Vulcan
cent	motor	1,200	10	Stromberg	circ-spl	cone	selec	unit-j	3	12.80 –1	dbl chn	.....	rad-rd		½-ell	½-ell	right	right	Vulcan
cent	motor	.....	.....	Zenith	circ-spl	cone	selec	unit-m	4	.....	spur-g-f	springs	springs		½-ell	½-ell	left	cent	Walter
cent	motor	.....	.....	Zenith	circ-spl	cone	selec	unit-m	4	.....	spur-g-f	springs	springs		½-ell	½-ell	left	cent	Walter
cent	motor	.....	.....	Zenith	circ-spl	cone	selec	unit-m	4	.....	spur-g-f	springs	springs		½-ell	½-ell	left	cent	Walter
cent	motor	.....	.....	Zenith	circ-spl	cone	selec	unit-m	4	.....	spur-g-f	springs	springs		½-ell	½-ell	left	cent	Walter Tractor
cent	motor	.....	14	Zenith	circ-spl	cone	selec	unit-m	4	.....	spur-g-f	springs	springs		½-ell	coil	left	cent	Watson
none	none	.....	.....	White	spl-press	wet-p	selec	amid	4	.....	bevel	springs	rad-rd		½-ell	½-ell	left	c & l	White GBBE
none	none	.....	.....	White	spl-press	wet-p	selec	amid	4	.....	doub-red	springs	rad-rd		½-ell	½-ell	left	c & l	White TBC
none	none	.....	.....	White	spl-press	wet-p	selec	amid	4	.....	dbl chn	.....	rad-rd		½-ell	½-ell	left	c & l	White TAD
none	none	.....	.....	White	spl-press	wet-p	selec	amid	4	.....	dbl chn	.....	rad-rd		½-ell	½-ell	left	c & l	White TCD
none	none	1,080	15	Stromberg	spl-press	cone	selec	unit-j	3	7.32 –1	dbl chn	.....	rad-rd		½-ell	½-ell	right	cent	Wichita A
none	none	1,085	15	Stromberg	spl-press	cone	selec	amid	3	7.80 –1	top worm	springs	springs		½-ell	½-ell	right	cent	Wichita K
none	none	1,200	15	Stromberg	spl-press	cone	selec	amid	3	8.66 –1	top worm	springs	springs		½-ell	½-ell	right	cent	Wichita L
none	none	1,050	13	Stromberg	spl-press	cone	selec	unit-j	3	8.24 –1	dbl chn	.....	rad-rd		½-ell	½-ell	right	cent	Wichita B
none	none	1,280	13	Stromberg	spl-press	cone	selec	amid	3	10.67 –1	top worm	springs	springs		½-ell	½-ell	right	.....	Wichita M
cent	motor	1,200	11	Stromberg	circ-spl	cone	selec	amid	3	11.75 –1	top worm	springs	springs		½-ell	½-ell	right	.....	Wichita O
cent	motor	1,500	20	opt	circ-spl	dry-d	selec	unit-m	3	6.00 –1	bevel	tor-t	tor-t		½-ell	½-ell	left	cent	Wilcox T
cent	motor	1,500	20	opt	circ-spl	dry-d	selec	unit-m	3	6.20 –1	top worm	springs	springs		½-ell	½-ell	left	cent	Wilcox N
cent	motor	1,500	18	opt	circ-spl	dry-d	selec	unit-m	3	6.50 –1	top worm	springs	springs		½-ell	½-ell	left	cent	Wilcox S
cent	motor	1,000	16	opt	circ-spl	cone	selec	amid	3	7.70 –1	top worm	springs	springs		½-ell	½-ell	left	cent	Wilcox R
cent	motor	1,008	18	Zenith	circ-spl	dry-d	selec	unit-m	3	6.00 –1	top worm	springs	springs		½-ell	½-ell	left	cent	Witt-Will WD1
cent	motor	1,085	15	Zenith	circ-spl	dry-d	selec	unit-m	3	7.75 –1	top worm	springs	springs		½-ell	½-ell	left	cent	Witt-Will WD2

Received Too Late to Classify

cent	motor	1,200	18	Schebler	circ-spl	dry-d	selec	unit-m	4	.....	top worm	springs	springs		½-ell	½-ell	right	cent	Acason
cent	motor	1,200	15	Schebler	circ-spl	dry-d	selec	unit-m	4	.....	top worm	springs	springs		½-ell	½-ell	right	cent	Acason
cent	motor	1,200	15	Carter	spl-press	dry-p	selec	unit-m	3	7.75 –1	top worm	tor-t	rad-rd		½-ell	½-ell	left	cent	Mogul LM
cent	motor	1,200	15	Carter	spl-press	dry p	selec	unit-m	3	7.75 –1	top worm	tor-t	rad-rd		½-ell	½-ell	left	cent	Mogul LW
cent	motor	1,200	15	Carter	spl-press	dry-p	selec	amid	3	7.75 –1	dbl chn	.....	rad-rd		½-ell	½-ell	left	cent	Mogul L
cent	motor	1,200	15	Carter	spl-press	.....	selec	amid	3	7.75 –1	dbl chn	.....	rad-rd		½-ell	½-ell	left	cent	Mogul T
cent	motor	700	5	Kingston	splash	exp-s	ind-c	unit-j	3	.....	int-gear	springs	.....		coil	coil	right	.....	Phoenix Centiped
cent	motor	1,200	15	.....	circ-spl	cone	selec	amid	3	.....	top worm	springs	springs		½-ell	½-ell	left	cent	Wilson E

ABBREVIATIONS: (continued). **Governor Type,** cent, *centrifugal;* l-b, *loose-ball;* suct, *suction;* hyd, *hydraulic;* elec, *electric.* **Governor Drive,** motor, *from motor;* d-shaft, *from driving shaft;* f-wheel, *from front wheel;* duplex, *from both the motor and driving shaft by overrunning clutches.* **Lubrication,** splash, *non-circulating or simple splash;* circ-spl, *circulating splash;* spl-press, *splash-pressure;* fuel-inj *fuel injection, oil mixed with fuel;* pressure, *pressure feed, no splash.* **Clutch Type,** dry-p, *dry plate;* dry-d, *dry multiple disk;* wet-d, *wet disk or disk-in-oil;* wet-p, *wet plate or plate-in-oil;* r-cone, *reversed cone or inverted cone;* cont-b, *contracting band;* exp-s, *expanding shoe.* **Gearset Type,** prog, *progressive sliding gear;* selec, *selective sliding gear;* plan, *planetary;* ind-c, *constant-mesh, individual-clutch;* fric, *friction;* elec, *electric.* **Gearset Location,** amid, *amidships;* unit-m, *unit with motor;* unit-j, *unit with jackshaft;* unit-x, *unit with axle.* **Gearset Speeds,** inf, *infinite number.* **Final Drive,** int-g, int-gear, *internal-gear;* sing chn, *single chain;* dbl chn, *double chain;* doub red, *double reduction;* spur-g, *spur gears;* sp-bev, *spiral bevel;* f, *front wheel or wheels;* 4, *four-wheel driven.* **Torque Taken By,** rad-rd, *radius rods;* tor-arm, *torque arm;* tor-t, *torsion tube;* sub-f, *sub-frame.* **Propulsion Taken By,** rad-rd, *radius rod;* tor-t, *torsion tube;* tor-arm, *torque arm;* sub-f, *sub-frame.* **Springs,** ellip, *elliptic;* ½-ell, *half elliptic;* ¼-ell, *quarter elliptic;* ¾-ell, *three-quarters elliptic;* plat, *platform;* cant, *cantilever.* **Control, Levers,** cent, *center;* c & r, *gearshift center, brake right;* c & l, *gearshift center, brake left.*

Prices of 1916 Gasoline Motor Trucks

Classified According to Load Capacity and Combined with Salient Features of Chassis

TRUCKS UNDER ½-TON CAPACITY

Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive
Brasie.....Packet	500	$450-c	100	pneu....	12.08	fric.....	dbl chn....
Kearns.....L	500	375	90	pneu....	12.08	selec....	bevel
Overland.....83	800	750-c	106	pneu....	27.20	selec....	bevel
R-S.....	350	305	65	pneu....	9.12	prog....	sing chn
Saxon.....	400	395	96	pneu....	12.08	prog....	bevel
Trumbull.....16D	500	300	80*	pneu....	13.37	selec....	bevel

TRUCKS OF ½-TON CAPACITY

Bauer.....A	1,000	720	100	solid*...	22.50	selec....	doub-red
Brinton.....H	1,200	815	98	cush*...	16.92	selec....	top worm
Croce.....16	1,000	800	104	pneu....	16.92	selec....	bevel
Crowther.....10-30	1,000	600	110	pneu....	22.50	rollers...	rollers
Detroit.....B	1,000	.....	112	pneu....	22.50	selec....	bevel
Dispatch.....L	1,200	900	120	pneu....	22.50	fric.....	dbl chn
Duryea.....	1,000	600	84	solid....	.....	rollers...	rollers
Falcon.....A	1,000	715	106	pneu....	14.40	selec....	bevel
Hanger.....B	1,000	875	110*	pneu....	16.92	selec....	top worm
Henderson.....C	1,200	1,100	106*	pneu....	19.61	selec....	top worm
Hannibal.....A	1,000	550	106	pneu....	16.92	selec....	
I.H.C.....MA	1,000	600-c	90	solid*...	20.00	ind-c....	dbl chn
I.H.C.....MW	1,000	710-c	90	solid*...	16.20	ind-c....	dbl chn
Kearns.....D	1,000	600	107	pneu....	16.92	selec....	bevel
Kisselkar.....	1,000	950	115	pneu....	24.22	selec....	bevel
Kosmath.....15	1,000	675	100	pneu....	15.65	selec....	bevel
Lambert.....VI	1,000	900	106*	pneu....	19.61	fric	dbl chn
Lippard-Stewart.....M	1,000	1,000	106	pneu....	14.40	selec....	top worm
Mercury.....P	1,000	650	85	solid....	14.50	plan....	dbl chn
Studebaker.....SF	1,000	785	112	pneu....	24.22	selec....	bevel
Vim.....18	1,000	620	100	pneu....	14.40	selec....	bevel
Wilcox.....T	1,000	1,000	115	pneu....	19.61	selec....	bevel

TRUCKS OF ¾-TON CAPACITY

Bauer.....B	1,500	840	110	solid*...	22.50	selec....	doub-red
Bessemer.....G	1,500	975	124	solid....	19.61	selec....	int-gear
Bollstrom.....A	1,500	1,200	125*	pneu*...	15.64	selec....	int-g-4
Buick.....D4	1,500	1,150	122	pneu....	22.50	selec....	bevel
Commerce.....N	1,500	875	120	pneu....	19.61	selec....	bevel
Dart.....BB	1,500	1,300	124	solid....	19.61	prog....	top worm
Denby.....U	1,500	890-c	119	solid....	15.64	selec....	int-gear
Diamond-T.....JA-JB	1,500	1,175	126*	solid....	19.61	selec....	top worm
Dorris.....IA4	1,500	1,900	144*	pneu....	30.65	selec....	bevel
Gabriel.....H	1,500	1,600	126	pneu....	27.20	selec....	bevel
Garford.....64	1,500	1,350	120	p&s.....	19.61	selec....	dbl chn
G.M.C.....15	1,500	1,090	122	pneu....	19.61	selec....	bevel
Geneva.....1	1,500	.....	96	solid....	22.10	plan....	dbl chn
I.H.C.....E	1,500	950-c	102	solid*...	16.20	ind-c....	dbl chn
Independent.....F	1,500	1,285	128*	solid*...	19.61	selec....	top worm
Krebs.....F	1,500	1,600	120	pneu....	22.50	selec....	top worm
Lippard-Stewart.....W	1,500	1,600	125*	pneu*...	22.50	selec....	top worm*
Little Giant.....15	1,500	1,500	120	p&s.....	19.61	selec....	top worm
Lincoln.....D	1,500	900	122	pneu....	22.50	selec....	bevel

TRUCKS OF ¾-TON CAPACITY (Cont'd)

Menominee.....E	1,500	1,125	124	solid....	22.50	selec....	sp-bev
Palmer-Moore.....K	1,500	1,150	106	solid*...	19.61	selec....	int-gear
Paulding.....D1	1,500	975	120*	solid....	16.92	selec....	int-gear
Reo.....F	1,500	1,000	120	pneu....	27.20	selec....	bevel
Republic.....F	1,500	995-c	124	solid*...	19.61	selec....	int-gear
Sanford.....O	1,500	1,290	120	pneu*...	19.61	selec....	int-gear
South Bend.....30	1,500	1,475	128	pneu....	22.50	selec....	top worm
Sterling.....	1,500	895	127	pneu....	15.64	prog....	top worm
Stewart (B).....3	1,500	.....	118*	pneu....	19.61	selec....	int-gear
Tiffin.....A-AC	1,500	1,400*	112	solid....	19.61	selec....	int-gear*
White.....GBBE	1,500	2,100	133½	pneu....	22.50	selec....	bevel
Wilcox.....N	1,500	1,200	120	pneu....	19.61	selec....	top worm

TRUCKS OF 1-TON CAPACITY

Adams.....A	2,000	1,850	136*	solid....	22.50	selec....	dbl chn
Atterbury.....6B	2,000	1,775	140½	solid....	22.50	selec....	top worm
Available.....	2,000	1,500	132*	solid....	22.50	selec....	top worm
Avery.....C	2,000	1,690	128	solid....	27.20	selec....	dbl chn
Barker.....U	2,000	2,000	130	solid....	25.60	selec....	top worm
Brockway.....H	2,500	1,600	124*	solid....	22.50	selec....	dbl chn
Brockway.....J	2,500	1,825	124*	solid....	22.50	selec....	top worm
Chase.....A	2,000	1,650	140	solid....	19.61	selec....	top worm
Continental (C).....FL	2,000	1,550	144*	solid....	22.50	selec....	top worm
Corbitt.....B	2,000	2,250	130	solid....	22.50	selec....	top worm
Dart.....B	2,000	1,400	138*	solid....	19.61	selec....	dbl chn
Denby.....B	2,000	1,475	120	solid....	19.61	selec....	int-gear
Fargo.....K	2,000	1,175	130	solid....	22.50	selec....	int-gear
Gabriel.....O	2,000	1,800	136	pneu....	27.20	selec....	top worm
Garford.....75	2,000	1,450	120	p&s.....	19.61	selec....	top worm
G.M.C.....25	2,500	1,800	144*	solid....	22.50	selec....	dbl chn
G.M.C.....26	2,500	1,800	144*	solid....	22.50	selec....	top worm
Gramm-Bernstein.....	2,000	1,500	118	solid....	19.61	ind-c....	top worm
Henderson.....D	2,000	1,500	124*	pneu*...	22.50	selec....	top worm
I.H.C.....F	2,000	1,500	128	solid*...	19.61	selec....	int-gear
Indiana.....S	2,000	.....	128	solid*...	19.61	selec....	top worm
Kelly-Springfield..K-30	2,000	2,000	120	solid*...	22.50	selec....	dbl chn
Kisselkar.....	2,000	1,500	125	pneu*...	24.22	selec....	top worm
Koehler.....K	2,000	870	129	solid....	19.61	selec....	int-gear
Krebs.....G	2,000	2,000	144	solid....	22.50	selec....	top worm
Lambert.....V3	2,000	1,800	120	solid....	32.40	fric.....	dbl chn
Landshaft.....GI	2,000	1,250	124*	solid....	19.61	selec....	int-gear
Lange.....C	2,000	1,750	130*	solid....	22.50	ind-c....	dbl chn
Lippard-Stewart.....H	2,000	2,000	145	solid....	22.50	selec....	top worm
Maccar.....K	2,000	2,100	150*	solid....	27.20	selec....	dbl chn
Maccar.....L	2,000	2,100	150*	solid....	27.20	selec....	top worm
Mack.....AB	2,000	2,000	144*	solid*...	25.60	selec....	top worm
Martin.....R	2,000	2,050	130	solid....	25.60	selec....	dbl chn*
Menominee.....F	2,500	1,575	130*	solid....	22.50	selec....	top worm
Modern.....T	2,000	.....	132*	solid....	19.61	selec....	top worm
Moreland.....	2,000	1,550	126	solid....	22.50	selec....	top worm
Nelson & LeMoon...E1	2,000	1,700	opt.....	solid....	22.50	selec....	top worm
Packard.....1D	2,000	2,200	126*	solid....	25.60	prog....	top worm
Palmer.....E	2,000	1,350	115½	pneu*...	22.50	selec....	int-gear
Palmer-Moore.....M	2,000	1,350	126	solid*...	22.50	selec....	int-gear
Paulding.....G-G1	2,000	1,300	120*	solid....	25.60	selec....	int-gear
Republic.....E	2,000	1,275	144	solid*...	22.50	selec....	int-gear
Rowe.....CW	2,000	2,450	130	solid....	16.92	selec....	top worm
Sanford.....P	2,000	1,350	138	pneu*...	19.61	selec....	int-gear

ABBREVIATIONS: General, *, *with other options;* opt, *optional.* **Price,** -c, *complete with body.* **Tires, Kind,** pneu, *pneumatic;* cush, *cushion;* sol-st, *solid in front steel in rear;* p&s, *pneumatic in front, solid in rear;* p&c, *pneumatic in front, cushion in rear;* c&s, *cushion in front, solid in rear.* **Gearset Type,** prog, *progressive sliding gear;* selec, *selective sliding gear;* plan, *planetary;* ind-c, *constant-mesh individual clutch;* fric, *friction;* elec, *electric.* **Final Drive,** bevel, *direct bevel;* doub-red, *double-reduction, bevel and spur;* int-gear, *internal-gear;* top worm, *worm gear with worm on top;* dbl chn, *double chain;* sing chn, *single chain;* -f, *to front wheels;* -4, *to all four wheels.*

TRUCKS OF 1-TON CAPACITY (Cont'd)

Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive
Selden.....T	2,000	1,700	126½*	solid....	19.61	selec....	top worm
Service.....120	2,000	1,375	135	solid....	19.61	selec....	top worm
Signal.....F	2,000	1,550	144*	solid....	22.50	selec....	top worm
Stewart (B).....4	2,500	.....	128	solid....	19.61	selec....	int-gear
Stewart (C).....A	2,000	700	96	solid....	20.00	plan....	dbl chn
Studebaker.....7	2,000	.....	125	pneu....	24.22	selec....	bevel
Superior.....A	2,000	1,350	124	solid*...	19.61	selec....	int-gear
Tiffin.....A1	2,000	1,600	112	solid....	19.61	selec....	int-gear
Transit.....E	2,000	2,000	130	solid....	32 40	selec....	dbl chn
Twin City.....	2,000	1,350	104*	solid....	20.00	plan....	dbl chn
Wichita.....A	2,000	1,650	110*	solid....	16.92	selec....	dbl chn
Wichita.....K	2,000	1,650	118*	solid....	19.61	selec....	top worm
Wilcox.....S	2,000	1,600	128	pneu....	22 50	selec....	top worm
Witt-Will.....WD1	2,240	.....	120	solid....	22.50	selec....	top worm

TRUCKS OF 1½-TON CAPACITY

Adams.....D	3,000	2,300	136*	solid....	27.20	selec....	dbl chn
Bessemer.....A	3,000	1,800	136	solid....	27.20	selec....	dbl chn
Continental (C).....HL	3,000	1,750	144	solid....	22 50	selec....	top worm
Croce.....	3,000	1,800	120*	solid....	25.60	selec....	top worm
DeKalb.....D1	3,000	1,950	134*	solid....	27.20	selec....	top worm*
Denby.....D	3,000	1,685	144*	solid....	22.50	selec....	int-gear
Diamond-T.....J2	3,000	2,050	160*	solid....	27.20	selec....	top worm
Federal.....M	3,000	1,800	144*	solid....	27.20	selec....	top worm
F.W.D.....G	3,000	3,600	124	solid....	32.40	ind-c....	bevel-4..
Gabriel.....M	3,000	2,200	144	pneu....	27.20	selec....	top worm
Garford.....66	3,000	1,800	142*	solid....	22 50	selec....	top worm
G.M.C.....31	3,000	1,900	144*	solid....	22.50	selec....	top worm
Gramm-Bernstein.....	3,000	1,800	130*	solid....	19.61	ind-c....	top worm
Horner.....F-G	3,000	.....	145*	solid....	27.20	selec....	t..p worm*
Indiana.....D	3,000	.....	135	solid....	27.20	selec....	top wom
Kelly-Springfield..K-31	3,000	2,050	144*	solid....	22.50	selec....	dbl chn
Kleiber.....1	3,000	2,250	140*	solid....	27.20	selec....	top worm
Larrabee.....	3,000	1,950	132	solid....	27.20	selec....	top worm
Lippard-Stewart.....F	3,000	2,300	145	solid....	27 20	selec....	top worm
Little Giant.....H	3,000	1,450	110	solid....	19.61	selec....	dbl chn
Mack.....AB	3,000	2,350	144*	solid*...	25 60	selec....	top worm
Mais.....C&D	3,000	2,600	132*	solid....	25.60	prog....	int-gear
Modern.....N	3,000	.....	144*	solid....	22.50	selec....	top worm
Mogul.....LM	3,000	1,600	125*	solid....	22.50	selec....	top worm
Moon.....B	3,000	1,650	140*	solid....	22.50	prog....	bevel
Moreland.....	3,000	1,850	126*	solid....	27.20	selec....	top worm
Netco.....C	3,000	2,250	144*	solid....	27.20	selec....	top worm
New York.....L	3,000	1,800	129*	solid....	22.50	selec....	top worm*
Old Reliable.....	3,000	1,950	138*	solid....	22.50	selec....	top worm
Packard.....1½D	3,000	2,500	126*	solid....	25.60	prog....	top worm
Paulding.....E-E1	3,000	1,600	130*	solid....	25.60	selec....	int-gear*
Sandow.....	3,000	1,800	150*	solid....	22 50	selec....	top worm
Service.....QW	3,000	2,200	150	solid....	27.20	selec....	top worm
Signal.....H	3,000	1,750	144	solid....	22.50	selec....	top worm
South Bend.....40	3,000	1,750	130*	solid....	25.60	selec....	top worm*
Stegeman.....	3,000	1,900	150	solid....	27.20	selec....	top worm*
Sullivan.....G	3,000	1,600	129	solid....	22.50	selec....	dbl chn
Tiffin.....GI-GC	3,000	1,800*	128	solid....	22.50	selec....	int-gear*
Universal.....G	3,000	1,950	130*	solid....	22.50	selec....	top worm
United.....AG	3,000	.....	144	solid*...	22.50	selec....	top worm
Velie.....25	3,000	2,250	150	solid....	27.20	selec....	top worm
White.....TBC	3,000	3,000	145½	pneu....	22.50	selec....	doub-red
Wichita.....L	3,000	1,800	118*	solid....	19.61	selec....	top worm
Wilcox.....R	3,000	1,800	134	solid....	29 00	selec....	top worm

TRUCKS OF 2-TON CAPACITY

Acason.....	4,000	2,100	150	solid....	29.00	selec....	top worm
Acme.....	4,000	2,000	148	solid....	27.20	selec....	top worm
Armleder.....HC	4,000	2,500	148*	solid....	27.20	selec....	dbl chn
Armleder.....HW	4,000	2,800	148*	solid....	27.20	selec....	top worm
Atterbury.....6C	4,000	2,375	153½	solid....	27.20	selec....	top worm
Autocar.....21F	4,000	1,650	97	solid*...	18.10	prog....	doub-red
Available.....	4,000	2,000	144*	solid....	27.20	selec....	top worm
Avery.....B	4,000	2,700	128	solid....	36.15	selec....	dbl chn
Barker.....V	4,000	2,400	136	solid....	25.60	selec....	top worm
Bessemer.....D	4,000	2,000	136	solid....	27.20	selec....	top worm
Blair.....2C	4,000	2,850	121*	solid....	22.50	ind-c....	top worm
Brockway.....1	4,000	1,900	140*	solid....	27.20	selec....	dbl chn

TRUCKS OF 2-TON CAPACITY (Cont'd)

Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive
Brockway.....K	4,000	2,125	140*	solid....	27.20	selec....	top worm
Burford.....O	4,000	2,000	132*	solid....	22.50	selec....	int-gear
Chase.....R	4,000	2,200	160*	solid....	27.20	selec....	top worm
Coleman.....J	4,000	2,400	132	solid....	25 60	selec....	top worm
Continental (C).....J	4,000	2,100	146	solid ..	27.20	selec....	top worm
Corbitt.....A	4,000	2,500	145*	solid....	27.20	selec....	top worm
Dart.....C	4,000	1,900	144*	solid....	27.20	selec....	dbl chn
Dayton.....U	4,000	2,650	118½	solid....	29.00	selec....	dbl chn
Denby.....E	4,000	1,985	144*	solid....	22.50	selec....	int-gear
Diamond-T.....J3	4,000	2,200	160*	solid....	.....	selec....	top worm
Dorris.....IAW	4,000	2,500	162*	solid....	30 65	selec....	top worm
Duplex.....C	4,000	2,800	130*	solid....	27.20	selec....	int-g-4
Duplex.....E	4,000	.....	130*	solid....	29.00	selec....	int-g-4
Fargo.....N	4,000	1,575	156	solid....	27.20	prog....	int-gear
Garford.....70	4,000	2,300	142*	solid....	29 00	selec....	top worm
G. A. Schacht.....	4,000	2,800	138*	solid....	29 00	selec....	top worm
G.M.C.....40	4,000	2,375	158*	solid....	27.20	selec....	dbl chn
G.M.C.....41	4,000	2,375	158*	solid....	27.20	selec....	top worm
Headley.....	4,000	3,000	145	solid....	27.20	selec....	dbl chn-4
Horner.....F-G	4,000	.....	145*	solid....	27.20	selec....	top worm*
Independent.....G	4,000	1,800	144	solid....	27.20	selec....	top worm
Jeffery.....4015	4,000	2,750	124	solid....	22.50	ind-c....	int-g-4
Kelly-Springfield..K-35	4,000	2,750	144*	solid....	22.50	selec....	dbl chn
Kisselkar	4,000	2,100	144	solid....	29 00	selec....	top worm
Knickerbocker.....16	4,000	2,200	148*	solid....	27.20	selec....	top worm
Krebs.....H	4,000	2,450	144*	solid....	27.20	selec....	top worm
Lambert.....V5	4,000	2,000	120	solid....	32.40	fric.....	dbl chn
Landshaft.....JI	4,000	1,550	144*	solid....	27 20	selec....	int-gear
Lange.....B	4,000	2,350	136*	solid....	27 20	ind-c....	dbl chn
Lippard-Stewart.....G	4,000	2,600	158	solid....	27 20	selec....	top worm
Little Giant.....16	4,000	2,500	144	solid....	27.20	selec....	top worm
Maccar.....J	4,000	2,600	162*	solid....	32.40	selec....	dbl chn
Maccar.....H	4,000	2,600	162*	solid....	32.40	selec....	top worm
Mack.....AB	4,000	2,700	144*	solid*...	25.60	selec....	top worm
Mais.....E&F	4,000	2,800	145*	solid....	25.60	prog....	int-gear
Martin.....S	4,000	2,150	121	solid....	25.60	selec....	dbl chn*
Menominee.....D	4,000	2,240	144	solid....	27.20	selec....	top worm
Modern.....R	4,000	.....	150*	solid....	27.20	selec....	top worm
Mogul.....LW	4,000	2,000	138*	solid....	27.20	selec....	top worm
Nelson & LeMoon...E2	4,000	2,250	opt.....	solid....	27.20	selec....	top worm
Netco.....D	4,000	2,350	144*	solid....	27.20	selec....	top worm
Old Reliable.....	4,000	2,750	120*	solid....	29.00	selec....	dbl chn
Packard.....2D	4,000	2,800	144*	solid....	25.60	prog....	top worm
Palmer.....	4,000	1,975	144	solid....	27 20	selec....	top worm
Paulding.....H-HI	4,000	1,950	160*	solid....	29 00	selec....	int-gear*
Peerless.....TC2	4,000	.....	145	solid....	32 40	selec....	top worm
Pierce-Arrow.....	4,000	3,000	150*	solid....	25.60	selec....	top worm
Reo.....J	4,000	1,650	146	solid....	27 20	selec....	dbl chn
Republic.....A	4,000	1,475	144	solid....	27 20	selec....	int-gear
Rowe.....CDW	4,000	2,800	144	solid....	25.60	selec....	top worm
Salvador.....	4,000	2,000	124*	cush....	25.60	selec....	top worm
Sandow.....	4,000	2,350	171*	solid....	27 20	selec....	dbl chn
Sandow.....	4,000	2,000	171*	solid....	27 20	selec....	top worm
Sanford.....M	4,000	1,910	140*	solid....	25.60	selec....	int-gear*
Selden.....JC	4,000	2,000	150	solid....	22.50	selec....	int-gear
Selden.....JWL	4,000	2,250	150*	solid....	27.20	selec....	top worm
Service.....PW	4,000	2,500	160*	solid....	27.20	selec....	top worm
Signal.....J	4,000	2,100	150	solid....	27.20	selec....	top worm
South Bend.....40-2	4,000	2,000	142	solid....	25 60	selec....	top worm*
Standard.....70	4,000	2,000	140	solid....	27.20	selec....	top worm
Sterling.....	4,000	2,800	148*	solid....	25.60	selec....	top worm
Sullivan.....E	4,000	2,250	150	solid....	27.20	selec....	top worm
Superior.....C	4,000	1,800	144	solid....	22.50	selec....	int-gear
Tiffin.....MW-MC	4,000	2,600*	140	solid....	27.20	selec....	top worm*
Tower.....	4,000	1,600	135	solid....	19 61	selec....	top worm
Transit.....F	4,000	2,850	144	solid....	32.40	selec....	dbl chn
Twin City.....	4,000	1,500	104*	solid....	19.61	prog....	dbl chn
Universal.....D	4,000	2,800	132*	solid....	25 60	selec....	dbl chn
United.....BSW	4,000	2,250	144*	solid....	27.20	selec....	top worm
U.S.....H	4,000	2,700	138	solid....	27.20	ind-c....	top worm
Vulcan.....	4,000	2,750	150*	solid....	30.00	selec....	dbl chn
Wichita.....B	4,000	2,100	118*	solid....	19.61	selec....	dbl chn
Wichita.....M	4,000	2,100	118*	solid....	19 61	selec....	top worm
Wilson.....E	4,000	2,000	144	solid....	27.20	selec....	top worm
Witt-Will.....WD2	4,480	2,250	144	solid....	27.20	selec....	top worm

TRUCKS OF 2½-TON CAPACITY

Adams.....E	5,000	2,500	140*	solid....	27.20	selec....	dbl chn
Armleder.....EC	5,000	2,800	148*	solid....	27.20	selec....	dbl chn

ABBREVIATIONS: **General,** *, *with other options;* opt, *optional.* **Price,** -c, *complete with body.* **Tires, Kind,** pneu, *pneumatic;* cush, *cushion;* sol-st, *solid in front, steel in rear;* p&s, *pneumatic in front, solid in rear;* p&c, *pneumatic in front, cushion in rear;* c&s, *cushion in front, solid in rear.* **Gearset Type,** prog, *progressive sliding gear;* selec, *selective sliding gear;* plan, *planetary;* ind-c, *constant-mesh individual clutch;* fric, *friction;* elec, *electric.* **Final Drive,** bevel, *direct bevel;* doub-red, *double-reduction, bevel and spur;* int-gear, *internal-gear;* top worm, *worm gear with worm on top;* dbl chn, *double chain;* sing chn, *single chain;* -f, *to front wheels;* -4, *to all four wheel*

TRUCKS OF 2½-TON CAPACITY (Cont'd)

Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive
Brinton.....F	5,000	2,250	138*	solid....	27.20	selec....	top worm
Croce.....	5,000	2,600	130	solid....	25.60	selec....	top worm
Dart.....CC	5,000	2,100	150	solid....	27.20	selec....	top worm
DeKalb.....D2	5,000	2,450	136*	solid....	27.20	selec....	top worm*
Gersix.....C	5,000	2,500	148*	solid....	33.75	selec....	top worm
Gramm-Bernstein.....	5,000	2,600	156	solid....	29.00	ind-c....	top worm
Kleiber.....2	5,000	2,750	150*	solid....	27.20	selec....	top worm
Larrabee.....	5,000	2,200	140*	solid....	27.20	selec....	top worm
Martin.....E	5,000	2,800	135	solid....	29.00	selec....	dbl chn*
Mogul.....L	5,000	2,250	138*	solid....	27.20	selec....	dbl chn
Moore.....	5,000	2,500	162½	solid....	32.40	selec....	dbl chn
Moreland.....	5,000	2,400	168*	solid....	32.40	selec....	top worm
Stegeman.....	5,000	2,500	144*	solid....	27.20	selec....	top worm*
Stegeman.....Special	5,000	2,500	142*	solid....	27.20	selec....	top worm*

TRUCKS OF 3-TON CAPACITY

A&B.....	6,000	.....	144	solid....	42.64	selec....	int-g-f
Avery.....B	6,000	3,200	128	solid....	36.15	selec....	dbl chn
Avery.....A	6,000	2,500-c	140	wood....	36.15	selec....	dbl chn
Beech Creek.....3A	6,000	.....	132	solid....	40.00	.....	bevel-4
Blair.....2D	6,000	3,250	121*	solid....	29.00	ind-c....	top worm
Coleman.....H	6,000	3,000	138	solid....	36.15	selec....	dbl chn
Duplex.....D	6,000	3,300	130*	solid....	29.00	selec....	int-g-4
F.W.D.....B	6,000	4,000	124	solid....	36.15	selec....	bevel-4
G. A. Schacht.....	6,000	3,200	168*	solid....	29.00	selec....	top worm
Horner.....F-G	6,000	.....	145*	solid....	32.40	selec....	top worm*
Kelly-Springfield..K-40	6,000	3,400	150*	solid....	32.40	selec....	dbl chn
Kisselkar.....	6,000	2,750	144	solid....	32.40	selec....	dbl chn
Krebs.....I	6,000	3,100	162*	solid....	27.20	selec....	top worm
Locomobile.....B	6,000	3,500	150	solid....	29.00	selec....	top worm
Mais.....K, L&H	6,000	3,300	132*	solid....	29.75	prog....	int-gear
Morton.....	6,000	.....	112	solid....	36.15	selec....	top worm-4
Nelson & LeMoon...E3	6,000	2,950	opt.....	solid....	32.40	selec....	top worm
Packard.....3D	6,000	3,400	156*	solid....	32.40	prog....	top worm
Peerless.....TC3	6,000	.....	151*	solid....	32.40	selec....	dbl chn
Republic.....T	6,000	2,400	165*	solid....	29.00	selec....	int-gear
Rowe.....DFW	6,000	3,400	156	solid....	29.00	selec....	top worm
Sandow.....	6,000	3,000	186*	solid....	32.40	selec....	dbl chn
Sandow.....	6,000	2,500	186*	solid....	32.40	selec....	top worm
Universal.....A	6,000	3,400	132*	solid....	25.60	selec....	dbl chn
Voltz.....C	6,000	2,750	142	solid....	32.40	selec....	dbl chn
Vulcan.....	6,000	3,250	156*	solid....	30.00	selec....	dbl chn
White.....TAD	6,000	3,700	163	solid....	22.50	selec....	dbl chn

TRUCKS OF 3½-TON CAPACITY

Acason.....	7,000	2,500	170	solid....	29.00	selec....	top worm
Armleder.....HW	7,000	3,500	156*	solid....	32.40	selec....	top worm
Atterbury.....6D	7,000	3,175	167½	solid....	32.40	selec....	top worm
Available.....	7,000	3,000	opt.....	solid....	32.40	selec....	top worm
Bessemer.....E	7,000	2,800	150	solid....	32.40	selec....	top worm
Burford.....D	7,000	.....	175*	solid....	32.40	selec....	top worm
C.T.....	7,000	4,800	132	solid....	36.15	elec.....	int-g-4
Continental (C).....M	7,000	3,000	168*	solid....	32.40	selec....	top worm
Couple-Gear.....HC	7,000	4,800	144	solid....	53.00	elec.....	bevel-4
Dayton.....A	7,000	3,400	136	solid....	36.15	selec....	dbl chn
Diamond-T.....L	7,000	3,300	164*	solid....	32.40	selec....	top worm
Federal.....L	7,000	2,800	146	solid....	32.40	selec....	top worm
G.M.C.....70	7,000	3,175	163*	solid....	32.40	selec....	dbl chn
G.M.C.....71	7,000	3,175	163*	solid....	32.40	selec....	top worm
Gramm-Bernstein.....	7,000	3,400	168	solid....	29.00	ind-c....	top worm
Hall.....	7,000	2,800	144*	solid....	32.40	prog....	dbl chn
Hall.....	7,000	2,800	144*	solid....	32.40	prog....	top worm
Harvey.....WH	7,000	2,700	168*	solid....	29.00	selec....	top worm

TRUCKS OF 3½-TON CAPACITY (Cont'd)

Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive
King.....	7,000	2,600	120	solid....	32.40	ind-c....	dbl chn
Kleiber.....3	7,000	3,300	160*	solid....	32.40	selec....	top worm
Knickerbocker.....16	7,000	2,850	164*	solid....	32.40	selec....	top worm
Maccar.....O	7,000	3,250	174*	solid....	32.40	selec....	dbl chn
Maccar.....M	7,000	3,250	174*	solid....	32.40	selec....	top worm
Mack.....AC	7,000	3,400	168*	solid....	40.00	selec....	dbl chn
Modern.....B	7,000	.....	176*	solid....	36.15	selec....	top worm
Mogul.....T	7,000	2,550	165*	solid....	32.40	selec....	dbl chn
Royal.....A	7,000	3,500	148	solid....	29.00	ind-c....	top worm
Selden.....N	7,000	2,950	164	solid....	32.40	selec....	top worm
Service.....HW	7,000	3,000	171*	solid....	32.40	selec....	top worm
Signal.....M	7,000	3,000	168*	solid....	32.40	selec....	top worm
South Bend.....60	7,000	3,250	160*	solid....	36.15	selec....	top worm
Standard.....60	7,000	2,850	144*	solid....	32.40	selec....	top worm
Stegeman.....	7,000	.....	156	solid....	33 75	selec....	top worm*
Sterling.....	7,000	3,400	158*	solid....	29.00	selec....	top worm
Transit.....T	7,000	3,500	144*	solid....	32.40	selec....	dbl chn
United.....CSW	7,000	2,900	144*	solid....	32.40	selec....	top worm
U.S.....J	7,000	3,400	162	solid....	32.40	ind-c....	top worm
Velie.....26	7,000	3,350	172	solid....	32.40	selec....	top worm
Wichita.....O	7,000	3,250	165	solid....	29.00	selec....	top worm

TRUCKS OF 4-TON CAPACITY

Blair.....2E	8,000	3,750	135*	solid....	32.40	ind-c....	top worm
Kelly-Springfield..K-45	8,000	3,600	150*	solid....	32 40	selec....	dbl chn
Kisselkar.....	8,000	3,350	162	solid....	38 25	selec....	dbl chn
Locomobile.....BB	8,000	3,650	150	solid....	29.00	selec....	top worm
Mais.....M	8,000	3,750	145*	solid....	29.75	prog....	int-gear
Martin.....L	8,000	3,300	145	solid....	36.15	selec....	dbl chn*
Moreland.....	8,000	3,200	186*	solid....	36.15	selec....	top worm
Old Reliable.....	8,000	3,750	126	solid....	36.15	selec....	dbl chn
Packard.....4D	8,000	3,800	156*	solid...	32.40	prog....	top worm
Peerless.....TC4	8,000	.....	151*	solid....	32.40	selec....	dbl chn
Standard.....40	8,000	3,025	144*	solid....	32.40	selec....	dbl chn

TRUCKS OF 5-TON CAPACITY

A&B.....	10,000	.....	144	solid....	42.64	selec....	int-g-f
Avery.....B	10,000	4,500	128	solid....	44.20	selec....	dbl chn
Blair.....2F	10,000	4,500	135*	solid....	32.40	ind-c....	top worm
C.T.....	10,000	5,200	156	solid....	41.61	elec.....	int-g-4
Couple-Gear.....AC	10,000	5,200	144	solid....	53.00	elec.....	bevel-4
Dayton.....B	10,000	4,500	148	solid....	44.20	selec....	dbl chn
F.W.D.....M	10,000	4,800	148	solid....	44.20	selec....	bevel-4
Garford.....D	10,000	4,300	128*	solid....	36.15	selec....	dbl chn
G.M.C.....100	10,000	.....	163*	solid....	32.40	selec....	dbl chn
G.M.C.....101	10,000	.....	163*	solid....	32.40	selec....	top worm
Hall.....	10,000	3,400	144*	solid....	32.40	prog....	dbl chn
Harvey.....WK	10,000	3,400	168*	solid....	32.40	selec....	top worm
Horner.....F	10,000	.....	156*	solid....	44.20	selec....	dbl chn
Kelly-Springfield..K-50	10,000	4,250	150*	solid....	32.40	selec....	dbl chn
Kleiber.....5	10,000	4,250	170*	solid....	44.20	selec....	top worm
Moore.....	10,000	4,500	175	solid....	44.20	selec....	dbl chn
Old Reliable.....	10,000	4,250	126*	solid....	36.15	selec....	dbl chn
Peerless.....TC5	10,000	.....	151*	solid....	32.40	selec....	dlb chn
Pierce-Arrow.....	10,000	4,500	168*	solid....	38.25	selec....	top worm
Rowe.....TW	10,000	4,500	156	solid....	36.15	selec....	top worm
Royal.....A	10,000	4,500	138*	solid....	36.15	ind-c....	top worm*
Saurer.....	10,000	4,800	153½	solid....	30.65	selec....	dbl chn
Service.....HX	10,000	4,000	171*	solid....	36.15	selec....	dbl chn
Standard.....50	10,000	3,400	144*	solid....	29.00	selec....	top worm
Stearns.....	10,000	3,800	144*	solid....	29.00	selec....	dbl chn
Sterling.....	10,000	4,500	178	solid....	32.40	selec....	dbl chn
Sterling.....	10,000	4,500	178	solid....	32.40	selec....	top worm
Tiffin.....RW-R	10,000	4,250*	168	solid....	33.75	selec....	top worm*
Transit.....V	10,000	4,500	144*	solid....	32.40	ind-c....	dbl chn

BREVIATIONS: General, *, *with other options;* opt, *optional.* **Price,** -c, *complete with body.* **Tires, Kind,** pneu, *pneumatic;* cush, *cushion;* sol-st, *solid in front, steel in rear;* p&s, *pneumatic in front, solid in rear;* p&c, *pneumatic in front, cushion in rear;* c&s, *cushion in front, solid in rear.* **Gearset Type,** prog, *progressive sliding gear;* selec, *selective sliding gear;* plan, *planetary;* ind-c, *constant-mesh individual clutch;* fric, *friction;* elec, *electric.* **Final Drive,** bevel, *direct bevel;* doub-red, *double-reduction, bevel and spur;* int-gear, *internal-gear;* top worm, *worm gear with worm on top;* dbl chn, *double chain;* sing chn, *single chain;* -f, *to front wheels;* -4, *to all four wheels.*

TRUCKS OF 5-TON CAPACITY (Cont'd)

Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive
United.....ESW	10,000	3,500	144*	solid....	41.61	selec....	top worm
U.S.....K	10,000	4,200	168	solid....	32.40	ind-c....	top worm
Veltz.....T	10,000	3,600	142	solid....	40.00	selec....	dbl chn
Vulcan.....	10,000	4,500	165*	solid....	30.00	selec....	dbl chn
Walter.....	10,000	4,750	144*	solid*...	30.65	selec....	spur-g-4
Watson.....	10,000	.....	158	s&st....	30.65	selec....	spur-g-f
White.....TCD	10,000	4,500	169	solid....	29.00	selec....	dbl chn

TRUCKS OF 5½-TON CAPACITY

Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive
Mack.....AC	11,000	4,000	168*	solid....	40.00	selec....	dbl chn

TRUCKS OF 6-TON CAPACITY

Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive
Doane.....	12,000	4,500-c	178	solid....	36.15	selec....	dbl chn
Garford.....F	12,000	4,500	128*	solid....	41.61	selec....	dbl chn
Gramm-Bernstein.....	12,000	4,300	168*	solid....	32.40	ind-c....	top worm
G. V. Mercedes.....FV	12,000	.....	169	solid....	29.00	selec....	int-gear
Kelly-Springfield..K-60	12,000	4,500	150*	solid....	32.40	selec....	dbl chn
Kisselkar.....	12,000	4,350	168	solid....	38.25	selec....	dbl chn
Old Reliable.....	12,000	4,500	126*	solid....	36.15	selec....	dbl chn
Peerless.....TC6	12,000	.....	151*	solid....	32.40	selec....	dbl chn
Royal.....A	12,000	4,800	140	solid....	41.61	ind-c....	dbl chn
Tiffin.....SW-S	12,000	4,550*	168	solid....	33.75	selec....	top worm*
Walter.....	12,000	5,000	144*	solid....	30.65	selec....	spur-g-4

TRUCKS OF 6½-TON CAPACITY

Name and Mode	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive
Saurer.....	13,000	5,800	156½	solid....	30.65	selec....	dbl chn

TRUCKS OF 7-TON CAPACITY AND OVER

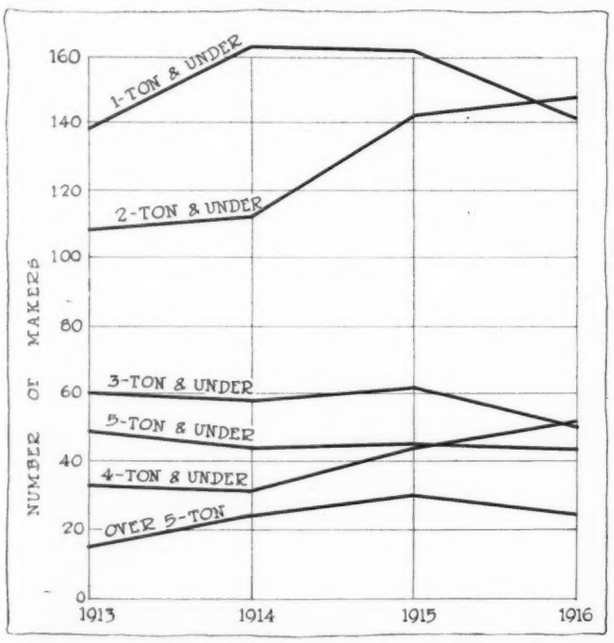
Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive
Dayton.....E	15,000	4,250	148	solid....	44.20	selec....	dbl chn
Mack.....AC	15,000	4,500	180	solid....	40.00	selec....	dbl chn
Sterling.....	14,000	4,750	178	solid....	36.15	selec....	dbl chn
Walter.....	15,000	5,250	144*	solid....	30.65	selec....	spur-g-4

TRACTORS

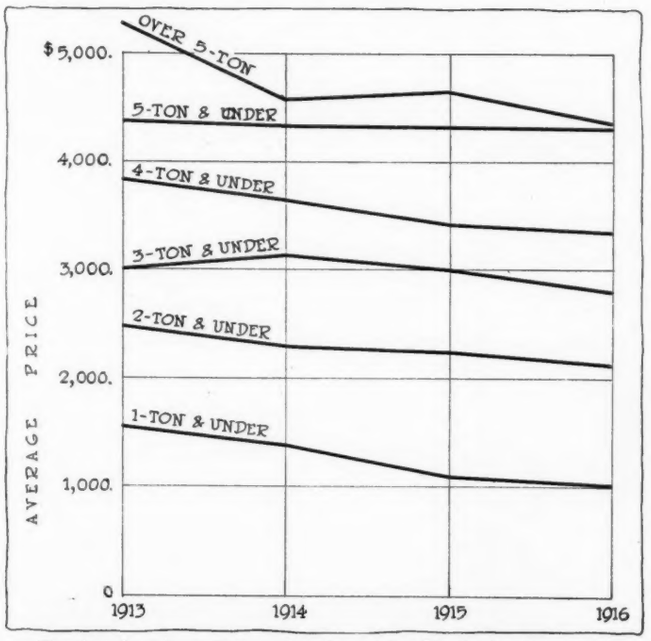
Name and Model	Capacity, Pounds	Chassis Price	Wheelbase	Tires	Motor Horsepower	Gearset Type	Final Drive
C.T.....	.....	5,000	.....	solid....	41.61	elec.....	int-g-4
Dominion.....	12,000	3,200	90	solid....	36.15	selec....	top worm
Knox.....35	.....	4,500	108	solid....	40.00	selec....	dbl chn
Lombard.....	10,000	.....	.....	steel....	.....	.....	top worm
Mack.....AC	30,000	4,000	116½	solid....	40.00	selec....	dbl chn
Mercury-Bulley.....A	.....	3,400	71	solid....	32.40	ind-c....	dbl chn
Mercury-Bulley.....	.....	3,400	71	solid....	32.40	ind-c....	dbl chn
Phoenix Centiped.....	.....	.....	.....	steel....	48.48	ind-c....	int-gear
Standard.....B	12,000	3,250	72	solid....	36.15	ind-c....	dbl chn
Standard.....D	20,000	4,000	76	solid....	36.15	ind-c....	dbl chn
Transport.....T	10,000	2,500	80	solid....	19.61	selec....	top worm
Walter.....	24,000	5,000	108*	solid....	30.65	selec....	spur-g-4

ABBREVIATIONS: General, *, *with other options;* opt, *optional.* **Price,** -c, *complete with body.* **Tires, Kind,** pneu, *pneumatic;* cush, *cushion;* sol-st, *solid in front, steel in rear;* p&s, *pneumatic in front, solid in rear;* p&c, *pneumatic in front, cushion in rear;* c&s, *cushion in front, solid in rear.* **Gearset Type,** prog, *progressive sliding gear;* selec, *selective sliding gear;* plan, *planetary;* ind-c, *constant-mesh individual clutch;* fric, *friction;* elec, *electric.* **Final Drive,** bevel, *direct bevel;* doub-red, *double-reduction, bevel and spur;* int-gear, *internal-gear;* top worm, *worm gear with worm on top;* dbl chn, *double chain;* sing chn, *single chain;* -f, *to front wheels;* -4 *to all four wheels.*

An Analysis of Tendencies in Load Capacities and Prices of Commercial Vehicles for Four Years



Above are illustrated the trends in load capacity, the number of makers of trucks of 1 ton and under jumping from 138 in 1913 to 163 in 1914 and holding to 162 the following year, the past year, however, showing a marked decrease to 141, a loss more than made up by the great increase in the number of makers of vehicles of 2 tons and under



Truck prices have been going down steadily during the past four years, the average 1-ton truck being $530.56 cheaper now than in 1913. Almost as marked a decline in price is shown in the 4-ton and under class which decreased its average price from $3,839.58 in 1913 to $3,413.64 for 1915 and $3,346.97 for 1916. There was a sharp drop in the price of the over 5-ton class during 1915

Technical Specifications of 53 Electric
The American Market

Complete Details of Construction of Electric Motor
turers, Including Particulars as to Battery, Motor,
Giving Load Capacity and Mileage Per Charge with

Name and Model	Load Capacity in Pounds	PRICE OF CHASSIS		Wheelbase in Inches	TIRES			BATTERY							MOTOR		
		With Battery	Without Battery		Kind	SIZES IN INCHES Front	SIZES IN INCHES Rear	Location	Make and Type	No. Plates	No. Cells	No. Trays	Amp.-Hr. Capacity	MILES PER CHARGE Light	MILES PER CHARGE Loaded	Location and Number	Make	Winding
Baker.....X	1,000	1,900	.....	86	solid...	36x3	36x3	amid-u...	Exide MV*.....	9*	42*	6*	112*	65*	45*	rear 1....	G.E.....	series...
Baker.....O	2,000	2,300	.....	102	solid...	36x3½	36x3½	amid u...	Exide MV*.....	11*	42*	7	140*	55*	40*	rear 1....	G.E.....	series...
Baker.....U	4,000	2,800	.....	120	solid...	36x4	36x3d	amid u...	Exide MV*.....	13*	42*	6	168*	53*	40*	rear 1....	G.E.....	series...
Baker.....CC	7,000	3,500	.....	137	solid...	36x6	38x4d	amid u...	Exide MV*.....	17*	42*	6	224*	50*	40*	rear 1....	G.E.....	series...
Baker.....EA	10,000	3,850	.....	137	solid...	36x7	38x5d	amid u	Exide MV*.....	19*	42*	6	252*	40*	35*	rear 1....	G.E.....	series...
Connorsville.....	750	750	600	80	solid...	.....	.....	rear u & h	Philadelphia*.....	17	16	2	204	.....	.....	....1....	G.E.....	series...
Couple-Gear..Tractor HF1	4,000	2,250	1,850	80	solid...	36x5	30x3½	amid-u...	U.S.L.-WBT.....	15	40	4	175	30	25	in wheel-1	Couple-Gear..	series...
Couple-Gear.....H	7,000	4,200	3,600	96	solid...	36x4d	36x4d	amid-u...	U.S.L.-WBT.....	25	44	6	275	40	30	in wheel-4	Couple-Gear.	series...
Couple-Gear.....A	10,000	4,800	4,100	98	solid...	36x5d	36x5d	amid-u	U.S.L.-WBT.....	27	44	6	300	35	25	in wheel-4	Couple-Gear.	series...
Couple-Gear.....AF	12,000	3,800	3,200	110*	s & st...	36x5d	60x5	amid-u...	U.S.L.-WBT.....	29	48	6	325	40	35	in wheel-2	Couple-Gear..	series...
C.T.....	1,000	.....	1,640	90*	solid...	36x2½	36x3	amid-u...	Edison-A4*.....	.....	60*	6*	150*	.....	.....	unit-x-2..	G.E.....	series...
C.T.....	2,000	.....	2,095	100*	solid...	36x3½	36x4	amid-u...	Edison-A6*.....	.....	60*	6*	225*	.....	.....	unit-x-2..	G.E.....	series...
C.T.....	4,000	.....	2,725	116	solid...	36x5	36x3½d	amid-u...	Edison-A8*.....	.....	60*	8*	300*	.....	.....	unit-x-2..	G.E.....	series...
C.T.....	7,000	.....	3,530	115*	solid...	36x3½d	36x4d	amid-u	Edison-A10*.....	.....	60*	8*	375*	.....	.....	unit-x-4..	G.E.....	series...
C.T.....	10,000	.....	3,935	132*	solid...	36x4d	36x5d	amid-u...	Edison-A12*.....	.....	60*	8*	450*	.....	.....	unit-x-4..	G.E.....	series...
G.M.C.....1	1,000	1,580	1,200	106*	solid...	32x3	32x3½	amid-o...	Edison-A4*.....	.....	60*	.....	150*	50*	45*	rear-1....	G.E.....	series...
G.M.C.....2	2,000	1,740	1,300	118*	solid...	32x3½	32x4	amid-o...	Edison-A5*.....	.....	60*	.....	187.5*	50*	42*	rear-1....	G.E.....	series...
G.M.C.....3	3,000	1,940	1,450	130*	solid...	32x4	32x5	amid-o...	Edison-A6*.....	.....	60*	.....	225*	50*	40*	rear-1....	G.E.....	series...
G.M.C.....4	4,000	2,200	1,650	138*	solid...	32x4	32x3½d	amid-o...	Edison-A6*.....	.....	60*	.....	225*	40*	32*	rear-1....	G.E.....	series...
G.M.C.....7	7,000	2,600	2,000	150*	solid...	32x5	36x4d	amid-o...	Edison-A8*.....	.....	60*	.....	300*	41*	32*	rear-1....	G.E.....	series...
G.M.C.....10	10,000	3,060	2,350	166*	solid...	36x6	36x6d	amid-o...	Edison-A10*.....	.....	60*	.....	375*	35*	27*	rear-1....	G.E.....	series...
G.M.C.....12	12,000	3,720	2,500	174*	solid...	36x6	36x7d	amid-o...	Edison-A10*.....	.....	60*	.....	375*	32*	24*	rear-1....	G.E.....	series...
G.V.....	1,000	.....	.....	88½	solid...	36x2½	36x2½	amid-u...	Philadelphia WTX*.	13*	44*	4*	153*	.....	50*†	rear-1....	G.E.....	series...
G.V.....	1,000	.....	.....	107½	solid...	36x3	36x3	u-hood...	Philadelphia WTX*.	15*	44*	4*	178.5*	.....	65*†	amid-1....	G.E.....	series...
G.V.....	2,000	.....	.....	103	solid...	36x3½	36x3½	amid-u...	Philadelphia WTX*.	17*	44*	5*	204*	.....	55*†	rear-1....	G.E.....	series...
G.V.....	4,000	.....	.....	111½	solid...	36x4	36x3d	amid-u...	Philadelphia WTX*.	21*	44*	6	225*	.....	55*†	rear-1....	G.E.....	series...
G.V.....	7,000	.....	.....	184	solid...	36x6	36x6d	amid-u...	Philadelphia WTX*.	27*	44*	6	331*	.....	50*†	rear-1....	G.E.....	series...
G.V.....	10,000	.....	.....	139	solid...	36x7	36x5d	amid-u...	Philadelphia WTX*.	31*	44*	6	382*	.....	45*†	rear-1....	G.E.....	series...
Lansden.....S	750	1,850	1,175	90	cush...	34x3	34x4	u-seat....	Edison-A4.....	.....	60	10	.....	.....	60	unit-x-1..	G.E.....	series...
Lansden.....M	1,000	2,310	1,500	90	solid...	36x2½	36x3	amid-u...	Edison-A4.....	.....	60	10	.....	.....	60	unit-j-1..	G.E.....	series...
Lansden.....M	2,000	2,900	1,700	106	solid...	36x3	36x3½	amid-u...	Edison-A6.....	.....	60	10	.....	.....	60	unit-j-1..	G.E.....	series...
Lansden.....M	4,000	3,660	2,100	120	solid...	36x4	36x3d	amid-u...	Edison-A8.....	.....	60	10	.....	.....	50	unit-j-1..	G.E.....	series...
Lansden.....M	7,000	4,455	2,475	130	solid...	36x5	36x4d	amid-u...	Edison-A10.....	.....	60	10	.....	.....	50	unit-j-1..	G.E.....	series...
Lansden.....M	10,000	5,190	2,850	142	solid...	36x6	36x5d	.....	Edison-A12.....	.....	60	10	.....	.....	50	unit-j-1..	G.E.....	.....
Lansden.....Tractor	20,000	3,660	2,100	58	solid...	30x4	30x5	amid-o...	Edison A8.....	.....	60	10	.....	.....	60	rear-1....	G.E.....	series...
Walker.....M	1,000	.....	.....	90*	solid...	34x3	36x3½	amid-u...	opt.....	.....	.....	.....	.....	.....	.....	unit-x-1..	Westinghouse	series...
Walker.....K	2,000	.....	.....	92*	solid...	34x3½	34x4	amid-u...	opt.....	.....	.....	.....	.....	.....	.....	unit-x-1..	Westinghouse	series...
Walker.....L	4,000	.....	.....	107*	solid...	38x4	38x6	amid-u...	opt.....	.....	.....	.....	.....	.....	.....	unit-x-1..	Westinghouse	series...
Walker.....D	6,000	.....	.....	126*	solid...	36x5	38x5	amid-u...	opt.....	.....	.....	.....	.....	.....	.....	unit-x-1..	Westinghouse	series...
Walker.....E	8,000	.....	.....	130*	solid...	36x6	38x5d	amid-u...	opt.....	.....	.....	.....	.....	.....	.....	unit-x-1..	Westinghouse	series...
Walker.....N	10,000	.....	.....	130*	solid...	36x7	38x6d	amid-u...	opt.....	.....	.....	.....	.....	.....	.....	unit-x-1..	Westinghouse	series...
Walker Tractor.....DK	20,000	.....	.....	74*	solid...	34x4	38x6*	rear-o...	opt.....	.....	.....	.....	.....	.....	.....	unit-x-1..	Westinghouse	series...
Ward.....WS	750	.....	.....	88	solid...	32x2½	32x2½	u-seat...	.....	9	42	3	100	.....	45	amid-1....	.....	series...
Ward.....EO	1,000	.....	.....	90	solid...	32x2½	34x3	amid-u...	.....	11	42	3	127	.....	45	amid-1....	.....	series...
Ward.....EA	2,000	.....	.....	99	solid...	34x3	36x4	amid-u...	.....	13	42	.....	153	.....	40	amid-1....	.....	series...
Ward.....EB	4,000	.....	.....	111	solid...	36x4	38x6	amid-u...	.....	17	42	.....	204	.....	35	amid-1....	.....	series...
Ward.....EC	7,000	.....	.....	132	solid...	38x6	40x3½d	amid-u...	.....	23	42	.....	280	.....	30	amid-1....	.....	series...
Ward.....ED	10,000	.....	.....	159	solid...	40x3½d	42x5d	amid-u...	.....	29	42	.....	357	.....	25	amid-1....	.....	series...
Waverley.....83	1,000	1,800	1,575	90	cush...	34x2½	34x2½	amid-u...	Exide*.....	11	42	6	.....	.....	50	rear-1....	Waverley.....	series...
Waverley.....	2,000	2,150	.....	104	solid...	35x5	35x5	amid-u...	Exide*.....	15	42	.....	.....	.....	45	rear-1....	G.E.....	series...
Waverley.....	4,000	3,000	.....	114	solid...	37x5	37x4d	amid-u...	Exide*.....	17	42	.....	.....	.....	35	rear-1....	G.E.....	series...
Waverley.....	7,000	3,400	.....	127	solid...	37x6	37x5d	amid-u...	Exide*.....	21	42	.....	.....	.....	35	rear-1....	G.E.....	series...
Waverley.....	10,000	3,950	.....	136	solid...	37x7	37x7d	amid-u...	Exide*.....	25	42	.....	.....	.....	.....	rear-1....	G.E.....	series...

ABBREVIATIONS: General, *, *with other options;* opt, *optional.* **Tires, Kind,** cush, *cushion;* s & st, *solid in front and steel in rear.* **Tire Sizes,** d, *dual.* **Battery, Location,** amid-u, *amidships, underslung below frame;* amid-o, *amidships over frame;* rear-o, *at rear, over frame;* rear-u & h, *at rear under frame and also under a hood forward;* u-hood, *under hood;* front-u, *in front, under frame;* u-seat, *under seat;* ends-o, *at both ends, over frame.* **Battery, Make and Type,** Exide-Ir, *Exide-Ironclad type.* **Miles per Charge, Loaded,** †, *half way light, half loaded.* **Motor, Location and Number** ,amid, *amidships;* unit-j, *unit with jackshaft;* unit-x, *unit with axle.* Numbers following *refer to number of motors in chassis.*

Commercial Vehicle Chassis Listed on for the 1916 Season

Trucks and Tractors Produced by Ten Manufac- Drive, Controller, Springs, Tires and Prices, and Type of Steer and Controller Lever Arrangement

MOTOR				CONTROLLER			DRIVE					SPRINGS		CONTROL		
Horse-power	Voltage	SPEED IN MILES PER HOUR		Location	SPEEDS		GEARING		Total Gear Ratio	Torque Taken By	Propulsion Taken By	Front	Rear	Steer	Controller Lever	Name and Model
		Light	Loaded		F'w'd	Rear	First Reduction	Final Reduction								
3	80	14½	13	u-seat	5	3	s-chain	dbl chn	10.60-1		rad-rd	½-ell	½-ell	wheel-l	u-wheel	Baker X
3½	85	12½	10½	u-seat	5	3	s-chain	dbl chn	10.00-1		rad-rd	½-ell	½-ell	wheel-l	u-wheel	Baker O
4	85	10	9	u-seat	5	3	s-chain	dbl chn	14.00-1		rad-rd	½-ell	½-ell	wheel-l	u-wheel	Baker U
4½	85	9	8	u-seat	5	3	s-chain	dbl chn	16.20-1		rad-rd	½-ell	½-ell	wheel-l	u-wheel	Baker CC
5	85	8	7	u-seat	5	3	s-chain	dbl chn	19.00-1		rad-rd	½-ell	½-ell	wheel-l	u-wheel	Baker EA
		14			4	2	none	herring		tor-t		½-ell	½-ell	lever-l	l-seat	Connorsville
3	80	10	7	btw seats	4	4	none	bevel-f	25.00-1	springs	springs	½-ell	½-ell	wheel-r	btw seats	Couple-Gear Tractor HF1
12	88	10	8	btw seats	5	5	none	bevel-4	25.00-1	tor-arm	rad-rd	½-ell	½-ell	wheel-r	btw seats	Couple-Gear H
12	88	8	7	btw seats	5	5	none	bevel-4	25.00-1	tor-arm	rad-rd	½-ell	½-ell	wheel-r	btw seats	Couple-Gear A
6	96	7	6	btw seats	4	4	none	bevel-f	25.00-1	tor-arm	rad-rd	½-ell	½-ell	wheel-r	btw seats	Couple-Gear AF
2½	60*	15	13	u-floor	4	2	spur gear	spur gear	10.00-1	springs	rad-rd	½-ell	½-ell	wheel-l	u-wheel	C.T.
3½	60*	14	12	u-floor	4	2	spur gear	spur gear	11.50-1	springs	rad-rd	½-ell	½-ell	wheel-l	u-wheel	C.T.
5	60*	12	10	u-floor	4	2	spur gear	spur gear	12.14-1	springs	rad-rd	½-ell	½-ell	wheel-l	u-wheel	C.T.
7	60*	11	9	u-floor	4	2	spur gear	spur gear-4	17.32-1	springs	rad-rd	½-ell	½-ell	wheel-l	u-wheel	C.T.
7	60*	9	7	u-floor	4	2	spur gear	spur gear-4	20.14-1	springs	rad-rd	½-ell	½-ell	wheel-l	u-wheel	C.T.
2½	60*		13	u-hood	5	1	bevel	dbl chn	8.40-1		rad-rd	½-ell	½-ell	wheel-l	t-wheel	G.M.C. 1
3½	60*		12	u-hood	5	1	bevel	dbl chn	11.00-1		rad-rd	½-ell	½-ell	wheel-l	t-wheel	G.M.C. 2
4	60*		11	u-hood	5	1	bevel	dbl chn	12.20-1		rad-rd	½-ell	½-ell	wheel-l	t-wheel	G.M.C. 3
4	60*		10	u-hood	5	1	bevel	dbl chn	12.20-1		rad-rd	½-ell	½-ell	wheel-l	t-wheel	G.M.C. 4
5½	60*		8	u-hood	5	1	bevel	dbl chn	12.70-1		rad-rd	½-ell	½-ell	wheel-l	t-wheel	G.M.C. 7
7	60*		7½	u-hood	5	1	bevel	dbl chn	15.70-1		rad-rd	½-ell	½-ell	wheel-l	t-wheel	G.M.C. 10
7	60*		6½	u-hood	5	1	bevel	dbl chn	15.70-1		rad-rd	½-ell	½-ell	wheel-l	t-wheel	G.M.C. 12
2	85*	14	12	u-seat	5	2	s-chain	dbl chn	14.89-1		rad-rd	½-ell	½-ell	wheel-l	l-seat	G.V.
2	85*	14	12	u-seat	5	2	none	top worm	9.00-1	springs	springs	½-ell	½-ell	wheel-l	l-seat	G.V.
2½	85*	12	10	u-seat	5	2	s-chain	dbl chn	10.76-1		rad-rd	½-ell	½-ell	wheel-l	l-seat	G.V.
2½	85*	11	9	u-seat	5	2	s-chain	dbl chn	11.61-1		rad rd	½-ell	½-ell	wheel-l	l-seat	G.V.
4	85*	10	8	u-seat	5	2	s-chain	dbl chn	13.95-1		rad-rd	½-ell	½-ell	wheel-l	l-seat	G.V.
5	85*	9	7	u-seat	5	2	s-chain	dbl chn	13.95-1		rad-rd	½-ell	½-ell	wheel-l	l-seat	G.V.
		60		u-hood	4	2	spur gear	bevel	12.00-1	tor-arm	springs	½-ell	½-ell	wheel-l	u-wheel	Lansden S
		60		u-hood	4	2	bevel	dbl chn	8.00-1		rad-rd	½-ell	½-ell	wheel-l	u-wheel	Lansden M
		60		u-hood	4	2	bevel	dbl chn	10.00-1		rad-rd	½-ell	½-ell	wheel-l	u-wheel	Lansden M
		60		u-hood	4	2	bevel	dbl chn	13.00-1		rad-rd	½-ell	½-ell	wheel-l	u-wheel	Lansden M
		60		u-hood	4	2	bevel	dbl chn	13.00-1		rad-rd	½-ell	½-ell	wheel-l	u-wheel	Lansden M
		60		u-hood	4	2	bevel	dbl chn	14.50-1		rad-rd	½-ell	½-ell	wheel-l	u-wheel	Lansden M
		60	8	u-seat	4	2	s-chain	dbl chn	9.00-1		rad-rd	½-ell	½-ell	wheel-l	u-wheel	Lansden Tractor
			15	u-seat	5	5	none	spur gear	17.00-1	springs	springs	½-ell	½-ell	wheel-l*	left	Walker M
			14	u-seat	5	5	none	spur gear	17.00-1	springs	springs	½-ell	½-ell	wheel-l*	left	Walker K
			12	u-seat	5	5	none	spur gear	17.00-1	springs	springs	½-ell	½-ell	wheel-l*	left	Walker L
			11	u-seat	5	5	none	spur gear	16.00-1	springs	springs	½-ell	½-ell	wheel-l*	left	Walker D
			11	u-seat	5	5	none	spur gear	16.00-1	springs	springs	½-ell	½-ell	wheel-l*	left	Walker E
			11	u-seat	5	5	none	spur gear	16.00-1	springs	springs	½-ell	½-ell	wheel-l*	left	Walker N
			8	u-seat	5	5	none	spur gear		springs	springs	½-ell	½-ell	wheel-l	left	Walker Tractor DK
		80		u-floor	4	2	none	sp-bev	6.10-1	springs	springs	½-ell	½-ell	wheel-l	u-wheel	Ward WS
		80		u-seat	4	2	s-chain	dbl chn			rad-rd	½-ell	½-ell	wheel-l	left	Ward EO
		80		u-seat	4	2	s-chain	dbl chn			rad-rd	½-ell	½-ell	wheel-l	left	Ward EA
		80		u-seat	4	2	s-chain	dbl chn			rad-rd	½-ell	½-ell	wheel-l	left	Ward EB
		80		u-seat	4	2	s-chain	dbl chn			rad-rd	½-ell	½-ell	wheel-l	left	Ward EC
		80		u-seat	4	2	s-chain	dbl chn			rad-rd	½-ell	½-ell	wheel-l	left	Ward ED
3½	85		14	u-seat	4	4	s-chain	herring		springs	springs	ellip	ellip	wheel-l	left	Waverley 83
	85		11	u-seat	4	4	bevel	dbl chn			rad-rd	½-ell	½-ell	wheel-l	left	Waverley
	85		9	u-seat	4	4	bevel	dbl chn			rad-rd	½-ell	½-ell	wheel-l	left	Waverley
	85		8	u-seat	4	4	bevel	dbl chn			rad-rd	½-ell	½-ell	wheel-l	left	Waverley
	85		7	u-seat	4	4	bevel	dbl chn			rad-rd	½-ell	½-ell	wheel-l	left	Waverley

ABBREVIATIONS: (continued). **Controller, Location,** u-seat, *under seat;* u-floor, *under floor of cab;* u-hood, *under hood;* btw seats, *between seats.* **Drive, Gearing, First Reduction,** s-chain, *silent chain.* **Final Reduction,** dbl chn, *double chain;* sp-bev, *spiral bevel gears;* herring, *herringbone gears;* -f, *to front wheels;* -4, *to all four wheels.* **Torque Taken By,** tor-arm, *torque arm;* tor-t, *torsion tube;* sub-f, *sub-frame.* **Propulsion Taken By,** rad-rd, *radius rods;* sub-f, *sub-frame.* **Springs,** ellip, *elliptic;* ½-ell, *half-elliptic;* ¾-ell, *three-quarters-elliptic;* trans-x, *transverse X-shape or reversed elliptic.* **Control Steer,** -l, *to the left;* -r, *to the right;* -c, *in the center.* **Controller Lever,** u-wheel, *under steering wheel;* t-wheel, *on top of steering wheel;* l-seat, *to left of seat;* btw seats *between seats;* cent, *center.*

A Price Guide to Electric Commercial Vehicles

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Classified According to Load Capacity and Including the Principal Points of Chassis Specification Relating to Trucks and Tractors Produced by Ten Manufacturers

TRUCKS UNDER ½-TON CAPACITY

Name and Model	Capacity in Lbs.	Chassis Price: With Battery	Chassis Price: Without Battery	Wh'l-base	Battery Location	Motor Location and Number	Final Drive
Connersville	750	$750	$600	80	rear-u&h	.....	herring
Lansden S	750	1,850	1,175	90	u-seat	unit-x-1	bevel
Ward WS	750	.....	.....	88	u-seat	amid-1	sp-bev

TRUCKS OF ½-TON CAPACITY

Name and Model	Capacity in Lbs.	Chassis Price: With Battery	Chassis Price: Without Battery	Wh'l-base	Battery Location	Motor Location and Number	Final Drive
Baker X	1,000	1,900	.....	86	amid-u	rear-1	dbl chn
C.T	1,000	.....	1,640	90*	amid-u	unit-x-2	spur gear
G.M.C 1	1,000	1,580	1,200	106*	amid-o	rear-1	dbl chn
G.V	1,000	.....	.....	88½	amid-u	rear-1	dbl chn
G.V	1,000	.....	.....	107½	u-hood	amid-1	top worm
Lansden M	1,000	2,310	1,500	90	amid-u	unit-j-1	dbl chn
Walker M	1,000	.....	.....	90*	amid-u	unit-x-1	spur gear
Ward EO	1,000	.....	.....	90	amid-u	amid-1	dbl chn
Waverley 83	1,000	1,800	1,575	90	amid-u	rear-1	herring

TRUCKS OF 1-TON CAPACITY

Name and Model	Capacity in Lbs.	Chassis Price: With Battery	Chassis Price: Without Battery	Wh'l-base	Battery Location	Motor Location and Number	Final Drive
Baker O	2,000	2,300	.....	102	amid-u	rear-1	dbl chn
C.T	2,000	.....	2,095	100*	amid-u	unit-x-2	spur gear
G.M.C 2	2,000	1,740	1,300	118*	amid-o	rear-1	dbl chn
G.V	2,000	.....	.....	103	amid-u	rear-1	dbl chn
Lansden M	2,000	2,900	1,700	106	amid-u	unit-j-1	dbl chn
Walker K	2,000	.....	.....	92*	amid-u	unit-x-1	spur gear
Ward EA	2,000	.....	.....	99	amid-u	amid-1	dbl chn
Waverley	2,000	2,150	.....	104	amid-u	rear-1	dbl chn

TRUCKS OF 1½-TON CAPACITY

Name and Model	Capacity in Lbs.	Chassis Price: With Battery	Chassis Price: Without Battery	Wh'l-base	Battery Location	Motor Location and Number	Final Drive
G.M.C 3	3,000	1,940	1,450	130*	amid-o	rear-1	dbl chn

TRUCKS OF 2-TON CAPACITY

Name and Model	Capacity in Lbs.	Chassis Price: With Battery	Chassis Price: Without Battery	Wh'l-base	Battery Location	Motor Location and Number	Final Drive
Baker U	4,000	2,800	.....	120	amid-u	rear-1	dbl chn
C.T	4,000	.....	2,725	116	amid-u	unit-x-2	spur gear
G.M.C 4	4,000	2,200	1,650	138*	amid-o	rear-1	dbl chn
G.V	4,000	.....	.....	111½	amid-u	rear-1	dbl chn
Lansden M	4,000	3,660	2,100	120	amid-u	unit-j-1	dbl chn
Walker L	4,000	.....	.....	107*	amid-u	unit-x-1	spur gear
Ward EB	4,000	.....	.....	111	amid-u	amid-1	dbl chn
Waverley	4,000	3,000	.....	114	amid-u	rear-1	dbl chn

TRUCKS OF 3-TON CAPACITY

Name and Mode	Capacity in Lbs.	Chassis Price: With Battery	Chassis Price: Without Battery	Wh'l-base	Battery Location	Motor Location and Number	Final Drive
Walker D	6,000	.....	.....	126*	amid-u	unit-x-1	spur gear

TRUCKS OF 3½-TON CAPACITY

Name and Model	Capacity in Lbs.	Chassis Price: With Battery	Chassis Price: Without Battery	Wh'l-base	Battery Location	Motor Location and Number	Final Drive
Baker CC	7,000	3,500	.....	137	amid-u	rear-1	dbl chn
Couple-Gear H	7,000	4,200	3,600	96	amid-u	in wheel 4	bevel 4
C.T	7,000	.....	3,530	115*	amid-u	unit-x-4	spur gear 4
G.M.C 7	7,000	2,600	2,000	150*	amid-o	rear-1	dbl chn
G.V	7,000	.....	.....	184	amid-u	rear-1	dbl chn
Lansden M	7,000	4,455	2,475	130	amid-u	unit-j-1	dbl chn
Ward EC	7,000	.....	.....	132	amid u	amid-1	dbl chn
Waverley	7,000	3,400	.....	127	amid-u	rear-1	dbl chn

TRUCKS OF 4-TON CAPACITY

Name and Model	Capacity in Lbs.	Chassis Price: With Battery	Chassis Price: Without Battery	Wh'l-base	Battery Location	Motor Location and Number	Final Drive
Walker E	8,000	.....	.....	130*	amid-u	unit-x-1	spur gear

TRUCKS OF 5-TON CAPACITY

Name and Model	Capacity in Lbs.	Chassis Price: With Battery	Chassis Price: Without Battery	Wh'l-base	Battery Location	Motor Location and Number	Final Drive
Baker EA	10,000	3,850	.....	137	amid-u	rear-1	dbl chn
Couple-Gear A	10,000	4,800	4,100	98	amid-u	in wheel-4	bevel 4
C.T	10,000	.....	3,935	132*	amid-u	unit-x-4	spur-gear-4
G.M.C 10	10,000	3,060	2,350	166*	amid-o	rear-1	dbl chn
G.V	10,000	.....	.....	139	amid-u	rear-1	dbl chn
Lansden M	10,000	5,190	2,850	142	.....	unit-j-1	dbl chn
Walker N	10,000	.....	.....	130*	amid-u	unit-x-1	spur gear
Ward ED	10,000	.....	.....	159	amid-u	amid-1	dbl chn
Waverley	10,000	3,950	.....	136	amid-u	rear-1	dbl chn

TRUCKS OF 6-TON CAPACITY

Name and Model	Capacity in Lbs.	Chassis Price: With Battery	Chassis Price: Without Battery	Wh'l-base	Battery Location	Motor Location and Number	Final Drive
Couple-Gear AF	12,000	3,800	3,200	110*	amid-u	in wheel-2	bevel f
G.M.C 12	12,000	3,720	2,500	174*	amid-o	rear-1	dbl chn

TRACTORS

Name and Model	Capacity in Lbs.	Chassis Price: With Battery	Chassis Price: Without Battery	Wh'l-base	Battery Location	Motor Location and Number	Final Drive
Couple-Gear HF1	4,000	2,250	1,850	80	amid-u	in wheel-1	bevel-f
Lansden	20,000	3,660	2,100	58	amid-o	rear-1	dbl chn
Walker DK	20,000	.....	.....	74*	rear-o	unit-x-1	spur gear

ABBREVIATIONS: General *, *with other options;* **Battery Location,** amid-u, *amidships, underslung below frame;* amid-o, *amidships over frame;* rear-o, *at rear, over frame;* rear-u&h, *at rear under frame and also under a hood forward;* u-hood, *under hood;* front-u, *in front, under frame;* u-seat, *under seat;* ends-o, *at both ends, over frame.* **Motor, Location and Number,** amid, *amidships;* unit-j, *unit with jackshaft;* unit-x, *unit with axle.* Numbers following *refer to number of motors in chassis.* **Final Drive,** dbl chn, *double chain;* sp-bev, *spiral bevel gears;* herring, *herringbone gears;* -f, *to front wheels;* -4, *to all four wheels.*

A Directory of Motor Truck Makers

247 Manufacturers of Gasoline, Steam and Electric Commercial Vehicles for 1916

Name	Manufacturer	Address	MODELS IN TONS CAPACITY *Figures refer to capacity, not number of models*													
			Under ¼	½	¾	1	1½	2	2½	3	3½	4	5	5½	6	6½	7 and over
Gasoline Vehicles																	
A. & B.	American & British Mfg. Co.	Providence, R. I.								3			5				
A. & R.	Abendroth & Root Mfg. Co.	Newburgh, N. Y.								3		4	5				
Acme	Cadillac Auto Truck Co.	Cadillac, Mich.						2									
Adams	Adams Truck, Fdy. & Machine Co.	Findlay, Ohio				1	1½		2½								
Acason	Acason Motor Truck Co.	Detroit, Mich.						2			3½						
Allis-Chalmers	Allis-Chalmers Mfg. Co.	Milwaukee, Wis.											5				
Armleder	O. Armleder Co.	Cincinnati, Ohio						2	2½		3½						
Atterbury	Atterbury Motor Car Co.	Buffalo, N. Y.				1		2			3½						
Auglaize	Auglaize Motor Car Co.	New Bremen, Ohio			¾												
Autocar	Autocar Co.	Ardmore, Pa.					1½	2									
Available	Available Truck Co.	Chicago, Ill.				1		2			3½						
Avery	Avery Co.	Peoria, Ill.				1		2		3			5				
Barker	C. L. Barker	Norwalk, Conn.				1		2									
Bauer	Bauer Machine Wks. Co.	Kansas City, Mo.		½	¾												
Beach Creek	Beach Creek Truck & Auto Co.	Beach Creek, Pa.								3							
Bell	Bell Motor Car Co.	York, Pa.		¾													
Bessemer	Bessemer Motor Truck Co.	Grove City, Pa.			¾		1½	2			3½						
Blair	Blair Motor Truck Co.	Newark, Ohio						2		3		4	5				
Board	B. F. Board Motor Truck Co.	Alexandria, Va.															
Bollstrom	Bollstrom Products Sales Co.	Battle Creek, Mich.			¾												
Brasie	Brasie Motor Truck Co.	Minneapolis, Minn.	¼														
Brennan	Brennan Mfg. Co.	Syracuse, N. Y.															4
Brinton	Chester County Motor Co.	Coatesville, Pa.		½					2½								
Briscoe	Briscoe Motor Co.	Jackson, Mich.		½													
Brockway	Brockway Motor Wagon Co.	Cortland, N. Y.				1½		2									
Bucklen	H. E. Bucklen, Jr., Motor Truck Co.	Elkhart, Ind.			¾		1½		2½								
Buick	Buick Motor Co.	Flint, Mich.			¾												
Burford	H. G. Burford Co.	Fremont, Ohio						2			3½						
Carlton	Carlton-Hill Motor Car Co.	Rutherford, N. J.															
Carroll	Carroll Motor Car Co.	Strassburg, Pa.															
Casey	F. A. Casey	Billerica, Mass.		½													
Chase	Chase Motor Truck Co.	Syracuse, N. Y.				1		2			3½						
Coleman	Coleman Carriage & Harness Co.	Ilion, N. Y.						2		3							
Columbia	Columbia Motor Truck & Trailer Co.	Pontiac, Mich.						2									
Commerce	Commerce Motor Car Co.	Detroit, Mich.			¾												
C. T.	Commercial Truck Co. of America	Philadelphia, Pa.									3½		5				T
Continental (C)	Continental Motor Truck Co.	Chicago, Ill.				1	1½	2			3½						
Continental (S)	Continental Truck Mfg. Co.	Superior, Wis.					1½			3							
Corbitt	Corbitt Automobile Co.	Henderson, N. C.				1		2									
Couple-Gear	Couple-Gear Freight Wheel Co.	Grand Rapids, Mich.									3½		5				
Crawford	Crawford Automobile Co.	Hagerstown, Md.								3							
Croce	Croce Automobile Co.	Asbury Park, N. J.		½			1½		2½								
Crowther	Crowther Motor Co.	Philadelphia, Pa.		½													
Crown	Crown Commercial Car Co.	N. Milwaukee, Wis.			¾		1½		2½								
Curtis	Pittsburgh Machine Tool Co.	Braddock, Pa.						2		3							
Dain	Dain Mfg. Co.	Ottumwa, Iowa				1											
Dart	Dart Motor Truck Co.	Waterloo, Iowa			¾	1		2	2½								
Dayton	Durable Dayton Truck Co.	Dayton, Ohio						2			3½		5				7½
DeKalb	DeKalb Wagon Wks.	DeKalb, Ill.					1½		2½								
Denby	Denby Motor Truck Co.	Detroit, Mich.			¾	1	1½	2									
Detroit	Detroit Commercial Car Co.	Pontiac, Mich.		½													
Diamond-T	Diamond-T Motor Car Co.	Chicago, Ill.			¾		1½	2			3½						
Dispatch	Dispatch Motor Car Co.	Minneapolis, Minn.		¾													
Doane	Doane Motor Truck Co.	San Francisco, Cal.													6		
Dorris	Dorris Motor Car Co.	St. Louis, Mo.			¾			2									
Duffy	Duffy Bros. Motor Truck Co.	San Francisco, Cal.															
Duplex	Duplex Power Car Co.	Charlotte, Mich.						2		3							
Durocar	Amalgamated Motors Corp.	Alhambra, Cal.		½													
Duryea	Duryea Laboratories	Philadelphia, Pa.		½													
Dominion Tractor	Dominion Motor Truck Co.	Detroit, Mich.													6		T
Eastern	Eastern Power Truck Co.	Providence, R. I.															
Elbert	Elbert Motor Car Co.	Tacoma, Wash.															
Elmira	Elmira Commercial Car Co.	Elmira, N. Y.															
Erie	Erie Motor Truck Mfg. Co.	Erie, Pa.															
Falcon	Falcon Motor Truck Co.	Detroit, Mich.		½													
Fargo	Fargo Motor Car Co.	Chicago, Ill.				1		2									
Fawick	Fawick Motor Car Co.	Sioux Falls, S. D.		½	¾	1		2									
Federal	Federal Motor Truck Co.	Detroit, Mich.					1½				3½						
Forschler	Phillip Forschler Wagon Co.	New Orleans, La.					1½										
F.W.D.	Four Wheel Drive Auto Co.	Clintonville Wis.					1½			3			5				
Franklin	Franklin Commercial Truck Co.	Franklin, Pa.															
Gabriel	Gabriel Auto Co.	Cleveland, Ohio			¾	1	1½										
Garford	Garford Motor Truck Co.	Lima, Ohio			¾	1	1½	2					5		6		
Gary	Gary Motor Truck Co.	Gary, Ind.			¾	1	1½	2									
G. A. Schacht	G. A. Schacht Motor Truck Co.	Cincinnati, Ohio						2		3							
Gay	S. G. Gay Co.	Ottawa, Ill.															
Geneva	Geneva Wagon Co.	Geneva, N. Y.			¾												
Gersix	Gerlinger Motor Car Co.	Portland, Ore.		2½													
Globe	Globe Furniture Co.	Northville, Mich.															
G.M.C.	General Motors Truck Co.	Pontiac, Mich.			¾	1½	1½	2			3½		5				

Heavy type represents vehicles whose specifications are given in this issue.

A Directory of 247 Manufacturers of Gasoline, Steam

Name	Manufacturer	Address	MODELS IN TONS CAPACITY (Figures refer to capacity, not number of models)													
			Under ½	½	¾	1	1½	2	2½	3	3½	4	5	5½	6	6½	7 and over
Gramm-Bernstein	Gramm-Bernstein Co.	Lima, Ohio				1	1½		2½		3½				6		
Great Southern	Great Southern Automobile Co.	Birmingham, Ala.						2				4					
G.V.-Mercedes	General Vehicle Co.	Long Island City, N. Y.													6		
Hahn	Hahn Motor Truck Co.	Hamburg, Pa.															
Hall	Lewis-Hall Iron Wks.	Detroit, Mich.									3½		5				
Handy Wagon	Auburn Motor Chassis Co.	Auburn, Ind.	½	½													
Hanger	C. F. Hanger Co.	Cleveland, Ohio.		½													
Harrison	Robert Harrison Co.	So. Boston, Mass.															
Harvey	Harvey Motor Truck Co.	Harvey, Ill.									3½		5				
Henderson	Henderson Bros.	North Cambridge, Mass.		½		1											
Hercules	Hercules Motor Truck Co.	So. Boston, Mass.															
Headley	Headley Bros.	Gosport, Ind.						2									
Horner	Detroit-Wyandotte Motor Co.	Wyandotte, Mich.					1½	2		3			5				
Haughton	Haughton Sulky Co.	Marion, Ohio.				1											
Howard	R. G. Howard.	Boston, Mass.			¾												
Hurlburt	Hurlburt Motor Truck Co.	New York City.				1		2			3½						
Hannibal	Hannibal Motor Car Co.	Hannibal, Mo.		½													
I. H. C.	International Harvester Corp.	Akron, Ohio.		½	¾	1											
Independent	Independent Motors Corp.	Port Huron, Mich.			¾			2									
Indiana	Harwood-Barley Mfg. Co.	Marion, Ind.				1	1½			3			5				
Iowa	Iowa Motor Truck Co.	Ottumwa, Iowa.				1	1½										
Jeffery	Thomas B. Jeffery Co.	Kenosha, Wis.						2									
Kanawha	Kanawha Auto Truck Co.	Charleston, W. Va.															
Kearns	Kearns Motor Car Co.	Beavertown, Pa.	½	½													
Kelly-Springfield	Kelly-Springfield Motor Truck Co.	Springfield, Ohio.				1	1½	2		3		4	5		6		
King	A. R. King Mfg. Co.	Kingston, N. Y.									3½						
Kisselkar	Kissel Motor Car Co.	Hartford, Wis.		½		1		2		3		4			6		
Kleiber	Kleiber Co., Inc.	San Francisco, Cal.					1½		2½		3½		5				
Knickerbocker	Knickerbocker Motor Truck Co.	New York City.						2			3½						
Knox Tractor	Knox Motors Associates.	Springfield, Mass.															T
Koehler	H. J. Koehler S. G. Co.	Newark, N. J.				1											
Kopp	Kopp Motor Truck Co.	Buffalo, N. Y.					1½			3			5				
Kosmath	Kosmath Co.	Detroit, Mich.		½													
Krebs	Krebs Commercial Car Co.	Clyde, Ohio.			¾	1		2		3							
Lambert	Buckeye Mfg. Co.	Anderson, Ind.		½		1		2									
Landshaft	William Landshaft & Son.	Chicago, Ill.				1		2									
Lange	Lange Motor Truck Co.	Pittsburgh, Pa.				1		2									
Larrabee	Larrabee-Deyo Motor Truck Co.	Binghamton, N. Y.					1½		2½								
Lenox	Lenox Motor Car Co.	Boston, Mass.															
Lima	Lima Light Car Mfg. Co.	Lima, Ohio.		½													
Lippard-Stewart	Lippard-Stewart Motor Car Co.	Buffalo, N. Y.		½	¾	1	1½	2									
Little Giant	Chicago Pneumatic Tool Co.	Chicago, Ill.			¾		1½	2									
Lincoln	Lincoln Motor Truck Co.	Detroit, Mich.			¾												
Locomobile	Locomobile Co. of America.	Bridgeport, Conn.								3		4					
Lord Baltimore	Lord Baltimore Motor Truck Co.	Baltimore, Md.				1		2									
Lombard	Lombard Auto Tractor-Truck Corp.	New York City.											5				
Maccar	Maccar Co.	Scranton, Pa.				1		2			3½						
Mack	International Motor Co.	New York City.				1	1½	2			3½			5½			7½ T
Mais	Mais Motor Truck Co.	Indianapolis, Ind.					1½	2		3		4					
Martin	Martin Carriage Wks.	York, Pa.				1		2	2½			4					
Menominee	D. F. Poyer Co.	Menominee, Mich.			¾	1½		2									
Mercury	Mercury Mfg. Co.	Chicago, Ill.		½													
Mercury-Bulley Tractor	Mercury Mfg. Co.	Chicago, Ill.															T
Meta	Meta Co.	Waltham, Mass.				½											
Modern	Bowling Green Motor Car Co.	Bowling Green, Ohio.				1	1½	2			3½						
Mogul	Mogul Motor Truck Co.	St. Louis, Mo.					1½	2	2½		3½						
Monitor	Monitor Automobile Wks.	Janesville, Wis.		½		1											
Moon	Joseph W. Moon Buggy Co.	St. Louis, Mo.					1½										
Moore	Pacific Metal Products Co.	Torrence, Cal.							2½				5				
Moreland	Moreland Motor Truck Co.	Los Angeles, Cal.				1	1½		2½			4					
Morton	Morton Truck & Tractor Co.	Harrisburg, Pa.								3							
Mohawk	Mohawk Motor Truck Co.	Ravenna, Ohio.															
Natco	National Motor Truck Co.	Bay City, Mich.				1											
Nelson & LeMoon	Nelson & LeMoon.	Chicago, Ill.				1		2		3							
Netco	New England Truck Co.	Fitchburg, Mass.					1½	2									
Nevada	Nevada Mfg. Co.	Nevada, Iowa.								3							
New York	Tegetmeier & Reipe.	New York City.					1½										
O. K.	O. K. Motor Truck Co.	Detroit, Mich.				1½											
Old Hickory	Kentucky Wagon Mfg. Co.	Louisville, Ky.				1½											
Old Reliable	Old Reliable Motor Truck Co.	Chicago, Ill.					1½	2				4	5		6		
Overland	Willys-Overland Co.	Toledo, Ohio.	½														
Packard	Packard Motor Car Co.	Detroit, Mich.				1	1½	2		3		4					
Palmer	Palmer-Meyer Motor Car Co.	St. Louis, Mo.				1		2									
Palmer-Moore	Palmer-Moore Co.	Syracuse, N. Y.			¾	1											
Paulding	St. Louis Motor Truck Co.	St. Louis, Mo.			¾	1	1½	2									
Peerless	Peerless Motor Car Co.	Cleveland, Ohio.						2		3		4	5		6		
Phoenix Centiped	Phoenix Mfg. Co.	Eau Claire, Wis.															
Pierce-Arrow	Pierce-Arrow Motor Car Co.	Buffalo, N. Y.						2					5				
Piercy	Hub Motor Truck Co.	Columbus, Ohio.							2½								
Reo	Reo Motor Truck Co.	Lansing, Mich.			¾			2									
Republic	Republic Motor Truck Co.	Alma, Mich.			¾	1		2		3							
Robinson	Golden West Motors Co.	Sacramento, Cal.						2									
Rockford	Rockford Motor Truck Co.	Rockford, Ill.															
Rowe	Rowe Motor Co.	Downingtown, Pa.				1		2		3			5				
Royal	Royal Motor Truck Co.	New York City.									3½		5		6		
R.-S	Reading-Standard Co.	Reading, Pa.	½														
Salvador	Mansur Motor Truck Co.	Haverhill, Mass.						2									
Sandow	Sandow Truck Co.	Chicago, Ill.					1½	2		3							
Sanford	Sanford Motor Truck Co.	Syracuse, N. Y.			¾	1		2									
Saurer	International Motor Co.	New York City.											5			6½	
Saxon	Saxon Motor Co.	Detroit, Mich.	½														

Heavy type represents vehicles whose specifications are given in this issue.

and Electric Commercial Vehicles for 1916—Continued

Name	Manufacturer	Address	MODELS IN TONS CAPACITY *Figures refer to capacity, not number of models*													
			Under ½	½	¾	1	1½	2	2½	3	3½	4	5	5½	6	6½	7 and over
Schleicher	Schleicher Motor Vehicle Co.	New York City						2		3			5				
Selden	Selden Motor Vehicle Co.	Rochester, N. Y.				1		2			3½						
Service	Service Motor Truck Co.	Wabash, Ind.				1	1½	2			3½		5				
Siebert	Siebert Motor Truck Co.	Toledo, Ohio			¾												
Signal	Signal Motor Truck Co.	Detroit, Mich.				1	1½	2			3½						
Sphinx	Sphinx Motor Car Co.	York, Pa.		½													
South Bend	South Bend Motor Car Wks.	South Bend, Ind.			¾		1½	2			3½						
Standard	Standard Motor Truck Co.	Detroit, Mich.						2			3½	4	5				
Standard Tractor	Standard Tractor Co.	Brooklyn, N. Y.													6		10
Stearns	F. B. Stearns Co.	Cleveland, Ohio											5				
Steele	W. M. Steele	Worcester, Mass.						2		3		4	5				
Stegeman	Stegeman Motor Car Co.	Milwaukee, Wis.					1½		2½		3½						
Sterling	Sterling Motor Truck Co.	Milwaukee, Wis.			¾			2			3½		5				7
Stewart (B)	Stewart Motor Corp.	Buffalo, N. Y.			¾	1½											
Stewart (C)	Stewart Iron Wks.	Covington, Ky.				1											
Studebaker	Studebaker Corp.	Detroit, Mich.			¾	1											
Sullivan	Sullivan Motor Car Co.	Rochester, N. Y.					1½	2									
Superior	E. G. Willingham's Sons	Atlanta, Ga.				1		2									
Tiffin	Tiffin Wagon Co.	Tiffin, Ohio			¾	1	1½	2					5		6		
Toeppner	Toeppner Bros.	Bay City, Mich.															
Toledo	Toledo Motor Truck Co.	Toledo, Ohio															
Tower	Tower Motor Truck Co.	Greenville, Mich.						2									
Trabold	Trabold Motor Mfg. Co.	Johnstown, Pa.				1		2		3							
Transit	Transit Motor Car Co.	Louisville, Ky.				1		2			3½		5				
Transport Tractor	Transport Tractor Co.	Long Island City, N. Y.											5				T
Trumbull	Trumbull Motor Car Co.	Bridgeport, Conn.	½														
Twin City	Brasie Motor Car Co.	Minneapolis, Minn.				1		2									
Tulsa	Tulsa Automobile & Mfg. Co.	Tulsa, Okla.															
Universal	Universal Service Co.	Detroit, Mich.					1½	2		3							
United	United Motor Truck Co.	Grand Rapids, Mich.					1½	2			3½		5				
U. S.	United States Motor Truck Co.	Cincinnati, Ohio						2			3½		5				
Van Winkle	Van Winkle Motor Truck Co.	Atlanta, Ga.															
Velie	Velie Motor Vehicle Co.	Moline, Ill.					1½				3½						
Vim	Vim Motor Truck Co.	Philadelphia, Pa.		½													
Voltz	Voltz Bros.	Chicago, Ill.								3			5				
Vulcan	Driggs-Seabury Ordnance Co.	Sharon, Pa.						2		3			5				
Walter	Walter Motor Truck Co.	New York City											5		6		7½–12
Watson	Watson Wagon Co.	Canastota, N. Y.											5				
Ware	Twin City Four Wheel Drive Co.	St. Paul, Minn.								3							
Warren	Warren Motor Truck Co.	Warren, Ohio															
Washington	Washington Motor Car Co.	Hyattsville, Md.											5		6		7
Weier-Smith	Weier-Smith Truck Co.	Birmingham, Mich.					1½										
West Coast	West Coast Wagon Co.	Tacoma, Wash.															
White	White Co.	Cleveland, Ohio			¾		1½			3			5				
Wichita	Wichita Falls Motor Co.	Wichita Falls, Texas				1	1½	2			3½						
Wilcox	H. E. Wilcox Motor Co.	Minneapolis, Minn.		½	¾	1	1½										
Wilson	J. C. Wilson Co.	Detroit, Mich.						2									
Wisconsin	Myers Machine Co.	Sheboygan, Wis.			¾	1		2									
Witt-Will	Witt-Will Co.	Washington, D. C.				1	1½										
Woods Mobilette	Woods Mobilette Co.	Chicago, Ill.	½														
Zimmerman	Zimmerman Mfg. Co.	Auburn, Ind.		½													

Steam Vehicles

Stanley	Stanley Motor Carriage Co.	Newton, Mass.			¾	1½											
Titan	Titan Motor Car Co.	Newark, Del.															

Electric Vehicles

Argo	American Electric Car Co.	Saginaw, Mich.		½		1											
Andover	Andover Motor Vehicle Co.	Andover, Mass.					1½										
Atlantic	Atlantic Vehicle Co.	Newark, N. J.		½		1		2			3½		5				
Baker	Baker-R. & L. Co.	Cleveland, Ohio				1		2			3½		5				
Beaver	Beaver State Motor Co.	Gresham, Ore.															
Buffalo	Buffalo Electric Vehicle Co.	Buffalo, N. Y.				1											
Capitol	Capitol Truck Mfg. Co.	Denver, Col.															
Carl	Carl Electric Vehicle Co.	Toledo, Ohio															
Connorsville	Connorsville Buggy Co.	Connorsville, Ind.	½														
Couple-Gear	Couple-Gear Freight Wheel Co.	Grand Rapids, Mich.						2			3½		5		6		
C. T.	Commercial Truck Co.	Philadelphia, Pa.		½		1		2					5				
Dayton	Dayton Electric Car Co.	Dayton, Ohio															
Field	Field Omnibus Co.	New York City	18 to 38 passenger buses														
Fritchle	Fritchle Automobile & Battery Co.	Denver, Col.		½													
G.M.C.	General Motors Truck Co.	Pontiac, Mich.		½		1	1½	2			3½			5	6		
G.V.	General Vehicle Co.	Long Island City, N. Y.		½		1		2			3½			5			
Lansden	Lansden Co., Ltd.	Brooklyn, N. Y.	½	½		1		2			3½			5			T
Old Hickory	Kentucky Wagon Mfg. Co.	Louisville, Ky.				1											
Storms	Storms Electric Co.	Detroit, Mich.	½														
Urban	Kentucky Wagon Mfg. Co.	Louisville, Ky.			¾		1½		2½				4				
Voltacar	Cyco-Lectric Car Co.	New York City	½														
Walker	Walker Vehicle Co.	Chicago, Ill.		½		1		2		3		4	5				T
Ward	Ward Motor Vehicle Co.	Mount Vernon, N. Y.	½	½		1		2			3½		5				
Waverley	Waverley Co.	Indianapolis, Ind.		½		1		2			3½		5				

Heavy type represents vehicles whose specifications are given in this issue.

ENGINEERS COMPLETE WINTER SESSION

Nothing Settled by Ignition Talk

S.A.E. Discussion of Magneto versus Battery Inconclusive—Argument and Counter-Argument Leave Question Undecided

NEW YORK CITY, Jan. 6—The dominant feature of the winter professional session of the Society of Automobile Engineers, held at the Engineering Society Building here to-day, and which concluded the annual winter session of the society, was the discussion of battery vs. magneto ignition. That each has its field and its well-defined advantages was the conclusion reached by the majority of members, who were keenly interested in the discussion of this most pertinent factor of modern motor development. The session was well attended and demonstrated that the concentration of the professional work in one day is the wisest course.

The papers discussed were:

"Magneto vs. Battery Ignition," by Francis R. Hoyt, electrical engineer Simms Magneto Co., which stated the case for the magneto, claiming more power and general greater efficiency for the magneto system.

"Notes on Battery Ignition," by Alexander Churchward of the A. B. C. Starter Co., and "Battery vs. Magneto Ignition," by Frank Conrad, electrical engineer Westinghouse Electric & Mfg. Co., the two last named being opposed in their conclusions to the first paper.

Papers Taken Together

The papers were summarized in the last issue of THE AUTOMOBILE, and the discussion remained so general in character that there is no need to quote either paper in full detail.

Albion D. Libby, engineer of the Splitdorf Electrical Co., suggested that the discussion on all the ignition papers be taken together, and this was agreed to by K. W. Zimmerschied, chairman of the Standards Committee, who was presiding.

Battery Classification

Glenn S. Whitten failed to see the value of Mr. Churchward's classification of battery system, in which he mentions three different types, that having manual advance, that having automatic and that having semi-automatic advance. The proper classification he believes is the open and closed circuit.

Frank Conrad, Westinghouse electrical engineer, believes that in discussing ignition problems of to-day it is useless to bring up as an example a four-cylinder motor running at 1400 or 1500 r.p.m. The problem confronting ignition engineers now is eight- and twelve-cylinder motors running at 3000 r.p.m. Mr. Conrad declared it is not true that in the magneto the heat of the spark increases as the speed of the magneto increases. He said that this condition was merely due to the fact that there is an optical illusion in observing the discharge at the plug, because more sparks are created in a given amount of time. In justifying the claims for battery ignition, Mr. Conrad referred to the growing number using the battery ignition system.

Wm. G. Wall, National engineer, believes that all those who have used both types of ignition are likely to be prejudiced in favor of the magneto, and that he used to think magnetos were better because of the automatic advance feature, but has found that the advance is inappreciable and therefore, does not give any gain. "Of course," he went on, "the battery system has nothing to approach the automatic advance, although I think the magneto has advantages at high speed and I have had more horsepower output with magnetos. I had credited this to the follow-up current in the magneto. We see that the magneto is a self-contained instrument whereas the battery requires auxiliaries, and a generator is necessary. Furthermore, it is dependent upon the battery.

Question of Cost

"Both battery and magneto systems require power to drive them and the details are quite alike. The magneto has most of its parts near the driving system, while the battery has considerable wiring subject to troubles which may arise. There is no question that the battery system has great advantages and has been decreased greatly in cost. Therefore, many are coming to use it."

L. B. Brown of New York suggested that instead of the open-circuit and closed-circuit classification, the battery system be divided into cam-break and spring-break classes. In analyzing the advantages of the closed circuit, he stated that, if an ignition device were being designed for a single-cylinder motor, the period of contact of the primary would be made as short as possible. This same theory should apply to multi-cylinders.

R. H. Combs, Prest-O-Lite, took exception to Mr. Wall's remarks on the difficulties with battery systems due to the scattering of the units and said that as yet he has been unable to note any trouble due to this source.

Mr. Libby stated that while in his belief both battery and magneto ignition have their separate fields, it is incorrect to use a battery system on a car and then mark the switch as magneto. He also expressed himself as differing with Mr. Conrad's remark in his paper that there are space limitations with the magneto, thus cutting the voltage. He said that these remarks should not apply to the stationary-coil design on which there can be as many turns of secondary wire as are wanted.

Battery Exchange System

Regarding the battery situation, Mr. Libby said it is quite important to note the present tendency toward adjustments in battery exchange in the same way that adjustments are made on tires.

"This is a dangerous practice, as it results in the owner not giving attention to the battery, since he believes that for $5 he can secure a new battery. It often happens that owners will neglect the battery during the spring and summer and the result is that in the winter when the capacity of the battery is a limited percentage of the total rated capacity, the motor will not start." As an illustration to bring out the force of this statement, he stated that at 3 deg. above 0 deg. Fahr., the capacity of the battery is only 50 per cent of the rating.

Francis R. Hoyt took exception to Mr. Conrad's statement in saying that the spark heat does not increase with the speed on magneto ignition. He stated that this is entirely a matter of individual design and can be arranged to suit the engine. The reason for not furnishing more heat is simply that it is not necessary and not because it cannot be given. Another point which he brought out is that an error in timing of 1 deg. in the battery system is 2 deg. on the crankshaft, whereas generally magnetos are driven at crankshaft speed.

Herbert Chase, chief engineer of the Automobile Club of America, emphasized the point that in making ignition tests, the actual position of the spark in the cylinder is what should be observed and not merely the position of the spark lever on the steering wheel quadrant. He also said that Mr. Hoyt's statement that flame propagation depends upon the size of the spark has never been proved. He pointed out that once ignition is accomplished, no more effect occurs from a follow-up spark. Speaking from experience, as service manager at the Automobile Club of America, Mr. Chase said that the batteries on the car cause more trouble than any other detail.

Russell Huff, chief engineer of Dodge Bros. and president-elect of the S. A. E., said, "We are likely to lose sight of the part the carbureter plays in the successful ignition of the car. I would refer you to tests which have been made covering this identical subject. One speaker mentions the prolonged spark as a benefit. True, with poor carburetion a magneto will give more power, but when perfect mixtures are furnished it is not possible to get any more power from a magneto than from a battery. The magneto has not the range of advance of the battery system and I have found that the battery-ignited car will pull away from the magneto-ignited car on high speed. I have made tests on a motor which stood in a room 8 deg. below zero and the motor started on the third revolution of the crankshaft. I have seen this same motor fail to start in a warm atmosphere when suffering from a bad carbureter adjustment."

Examples of Large Advance

C. T. Kettering, vice-president of the Dayton Engineering Laboratories Co., cited a few examples of advance. He said that the Cadillac eight at 3000 r.p.m. and the Packard twelve at the same speed had 28 deg. advance while the Hudson six at 3000 has 27 deg. advance. Furthermore, he stated that it is not fair to attempt to analyze the whole problem from one type of ignition.

The Past and Future of the S. A. E.

President and President-Elect Review the Work Accomplished and the Tasks Ahead of the Society

NEW YORK CITY, Jan. 6—At the opening of the professional session of the S. A. E. in the Engineering Societies Building, President VanDervoort and President-Elect Russell Huff, each gave their views as to the past and future of the S. A. E.

President VanDervoort in opening the meeting made his parting address as a president of the S. A. E. He dwelt upon the accomplishments of the year and upon the outlook into the future. He stated that he had fully realized the responsibility of his position as president and that his only regret is that he was not able to accomplish more. He spoke of the importance of wisely selecting the officers and committees of the society in order that the work which has been planned will be successfully carried to a termination. Looking back over the year, Mr. VanDervoort said that the year had been one of constructive work by the society.

Following President VanDervoort, President-Elect Russell Huff told how he had taken part in the earlier development of the society and dwelt especially on the vast importance of the standardization work, saying that it had saved millions of dollars to the industry though as yet the work had but scratched the surface of what remained to be done.

Extracts from Presidential Address

After stating his appreciation of the position he held as president of the society Mr. VanDervoort continued:

"I have keenly appreciated the friendly and loyal support you have all given me and shall always look back upon the year of work and association with you as a most pleasant one. It has been a year of constructive work marked at every turn with that spirit of unselfishness, of cooperation and untiring effort on the part of all that has become characteristic of the entire industry of which the Society of Automobile Engineers constitutes so important an element. The story of the development of this industry reads like a fairy tale and to the engineer is due in large measure credit for the remarkable growth of the industry.

"It is to be regretted that our membership has, during the past year, fallen off somewhat. We believe, however, the standard of membership has improved. The past year included several of the very worst months of the recent business depression. Many good members found it necessary, for financial reasons, to drop out, and for the same reason much good material found it impossible to join. Again, we have systematically cleaned the membership lists of much dead material, leaving it at the present time in a most healthy condition. It has also been the policy of the council to scrutinize most carefully the qualifications of all applicants in the belief that we should first build up the quality of our membership and its work with the assurance that by so doing we will attract to the society the best membership material. I believe that although slightly weaker numerically, we have gained much in efficiency, 'By our efforts they shall know us.' Let us all look upon our membership in the Society of Automobile Engineers as an asset of no mean value and

let us gain in our work that recognition which will bring the unqualified support of every engineer and manager associated with the automobile industry.

Standards Not Realized

"I fear that the managements of many of our great automobile and accessory companies are not well informed as to the work the Society of Automobile Engineers is doing. They are all interested in the work of the society, either directly or indirectly, and we should use every effort to stimulate this interest in every way possible. We must have their interest in our work and their appreciation. This society has come to be a very necessary factor in the development of this greatest of American manufacturing industries and the unqualified support of those high up in the management of the affairs of these great institutions is absolutely essential to the healthy growth and development of our society.

Value Is Great

"We must labor for a keener appreciation of the stamp of the S. A. E., impressing upon all the desirability of following those recommendations made after a careful investigation and study of the various problems that are continually arising in this work. As engineers you are devoting your full energies toward the advancement of your employers' interests and it is only right that the employer should appreciate to the fullest extent your efforts. Largely through the instrumentality of this society you are kept in accord with that which is latest in automobile engineering work. In turn you are giving to others the benefit of your experience and judgment. Impress this fact upon those for whom you labor. Impress it upon those you feel would raise the standard of the society and be benefited themselves by membership in it.

"The success of this organization is due to the fact that its membership includes many of the best engineers in this line of work; that it has accomplished much in the way of research; that it has, in a measure, received the support of those higher up in the management of automobile industrial affairs. It is now verging, I predict, upon a still greater success, as indicated by the greater activities in the various sections, the greater interest shown in the work by those who heretofore have been passive in their recognition of the society. Better work means more and better members; more financial support; the widening of our lines of activities and the keener appreciation of our work by all. The measure of our success will be very largely determined by the wisdom of the policies as laid down by our manager and the council; by the thoroughness of the work accomplished by our standards committee; by the efforts of the individual members in the papers they present for publication; by the membership committee in its endeavor to interest good material in our work; by the enthusiasm of the members in the work of the sections and by the financial support we receive.

"The detail work that has devolved upon the chairman of the standards committee has become so great that steps will shortly have to be taken to relieve this officer of a still greater portion of this work through the organization of a suitable staff to take over the details of this most important branch of our activities.

"One of the most promising indications, to my mind, lies in the very marked activities of the various sections during the past year. Enthusiastic meetings have been held by all of the several sections and much good work accomplished. These meetings while benefiting directly the members, have had an equally broad, beneficial influence on the manufacturers in the various localities, as expressed by their recognition of the work of the society.

"The Midwest section starts its career under most favorable auspices and with a full realization of its responsibility to its members, the society and the automobile industry. Its membership includes many of the most earnest workers in the society and I feel sure that the Midwest section will make a good record for itself and bring honor to the society.

"The reorganization of the Pennsylvania section is of very great importance. This section again active in the work gives the society six localized centers of activities which with the support of the parent body can be depended upon for much good work.

Navy Board Appointment

"We have been honored with the request, and have elected two of our members to serve on the Naval Department Advisory Committee appointed by Secretary of the Navy Daniels. That our society will be well represented we feel sure, and in turn we can assure this committee and our government that unqualified support of every member of the S. A. E. should their services be required.

"Along the lines of standardization, it is the desire of the society to bring about a closer relationship between the manufacturers of the United States and European countries. While we fully appreciate the many serious obstacles standing in the way of international standards, we nevertheless believe that an effort should be made toward co-operation in that direction at this time, feeling that the situation can never become more favorable than it is to-day. We have placed our views on this subject and other features of our standardization work before the United States Bureau of Standards and have assurance of its support so far as consistently possible."

Following the president, Russell Huff spoke briefly in somewhat similar strain. He said:

"I have watched the growth of this society with keen interest for many years and when I review the vast amount of good work done by it since it was organized in 1905, it makes me feel proud to be one of its members. You have bestowed upon me the highest honor the society offers to its members in electing me to the presidency for the ensuing year. I fully appreciate your good intentions in this matter and am delighted to have this opportunity of extending to you my heartiest thanks for the faith and confidence which you show in me by this election.

"There is a great work ahead of us in carrying out the comprehensive plans which have been laid down by the society in the past. While the standards committee has already accomplished wonders in the pursuit of its work, it has really only scratched the surface, as is apparent when one stops to survey the field and sees the great possibilities for standardization work which are still untouched. This standardization work is a most worthy cause, and it needs your closest attention and constant support. While it is impossible to actually estimate in dollars and cents what our standards have saved the car manufacturer, the truck manufacturer, the tire manufacturer, the parts manufacturer and last but not least the customer, we know from the promptness with which manufacturers adopt our standards, from the high esteem in which this phase of our cause is held by the captains of this big industry, and from past records that it has saved the industry and consumer millions of dollars in added convenience and lower costs.

"It is my earnest hope that we can still

Officers of S. A. E.

President
Russell Huff

Vice-Presidents
E. S. Foljambe
R. H. Combs

Members of Council
To Serve Two Years
David Beecroft
E. R. Hall
J. G. Utz

To Serve One Year
G. W. Dunham

Treasurer
Herbert Chase

further increase the sphere of influence of this society. We already have six live sections and one student branch, but I believe there is room for more student branches and possibly more sections. A number of new lines of endeavor closely allied to automobile engineering should receive our attention. I have in mind the good roads movement, aeroplane and motor boat engine development, and manufacturing engineering. We also need a comprehensive library and a good engineering digest. I simply cite these few examples out of many new lines of work which this society could take up and work at for the benefit of the industry, to show the many possibilities for growth and influence."

Electric Lighting Itemized

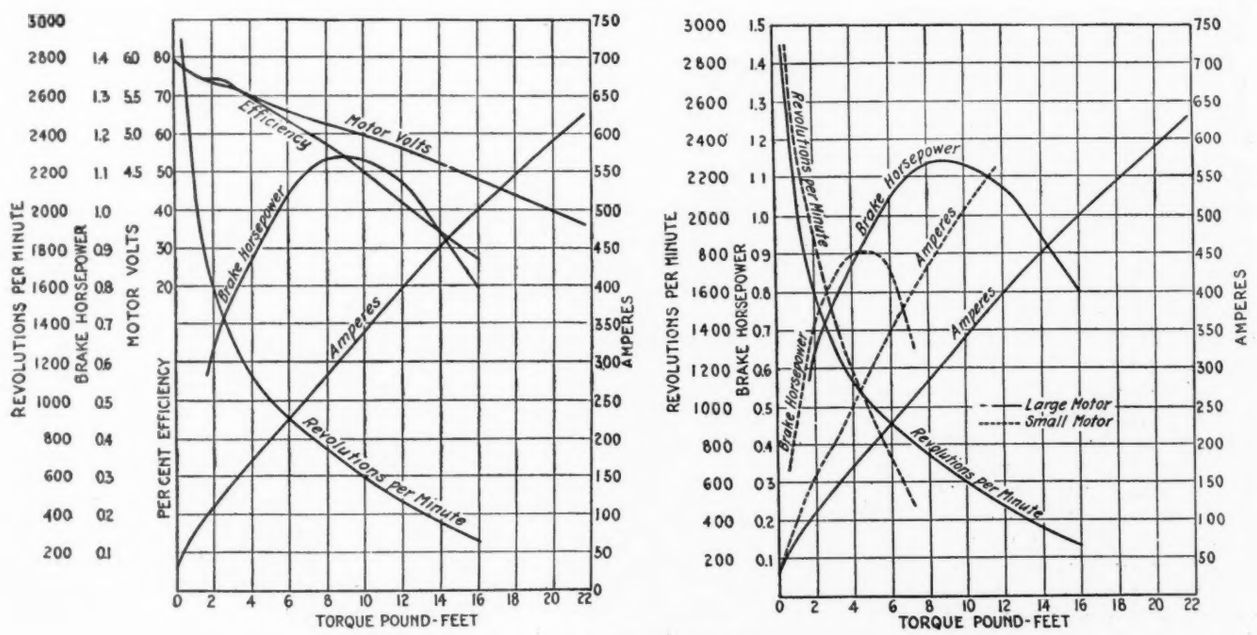
Joseph Bijur and Henry Schroeder Deal with Manufacture of Generators, Motors and Lamp Bulbs

NEW YORK CITY, Jan. 6—At the eleventh annual meeting of the S. A. E., the subject of lighting and starting was dealt with very fully by two authors who observed different sides of the manufacturing problem, these two papers making a completion of the review of automobile electricity commenced by the three other papers on the ignition systems of the day.

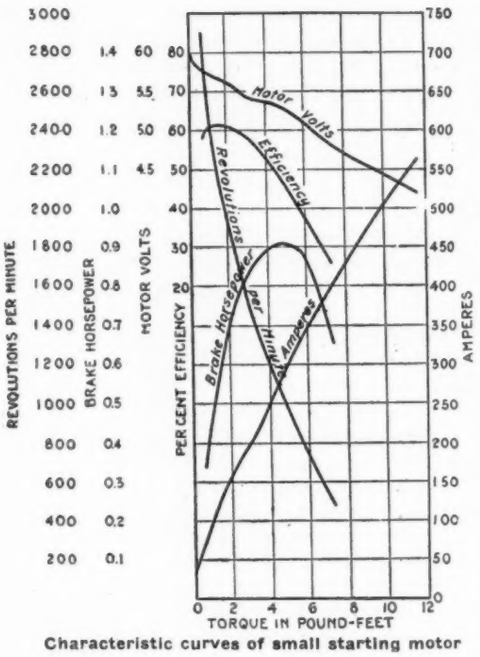
The first part of Joseph Bijur's paper dealt with the general principles of electrical equipment. The following is the second part of the paper and deals with the details of design.

Advantages of Bipolar Units

While the simplest generator to consider is a two-pole, one having a horseshoe or other shaped magnet, such generators have certain disadvantages; briefly, they have brushes 180 deg. apart, which usually means that if one brush is located so as to be accessible, the other, 180 deg. away, is necessarily inaccessible; also in such a bipolar generator the whole the flux has to pass through the entire length of the magnet circuit. If, as in a four-pole generator, we can split the flux so that we have to pass only half of it through half the length of the magnetic circuit, we can get a much more intense flux with the same amount of excitation. In such generators the brushes are 90 deg. apart at the commutator, which permits both brushes to be located in the upper or outer half-circle where both are accessible. If we consider such a four-pole generator and imagine that the exciting winding of the field magnet, known as the shunt winding, is connected across two main brushes, and that the iron always has some magnetism left in it at the beginning of rotation in the proper direction, the action will be as follows: The conductors cutting the residual flux generate a slight voltage and the sum of their added voltages appears as a difference of potential between the two brushes. Since the shunt winding is connected to these, a slight current flows through it, set up by this potential, thereby slightly increasing the excitation of the field magnet over the original residual excitation. The voltage of the armature is therefore higher, which in turn increases the field excitation, so that the voltage of the generator as a whole builds up to a value at which equilibrium is reached for any given speed of rotation. As the speed increases, the voltage of the generator rises from, say, zero to 7, at which point it is high enough to be useful in putting charge into the battery. Usually an automatic switch, excited by the generator voltage, closes at this time and connects the generator to the battery. Such a switch may be made by an arrangement of an electromagnet, having a spring-retracted armature which normally holds the circuit open, but closes it if the armature is attracted to the magnet core. The latter is energized by a fine-wire winding responsive to the voltage of the generator brushes. A coarse-wire coil of a few turns wound on the same magnet core is connected so as to be in series between the generator and the battery when the switch is closed, and its excitation by current from the generator in a direction to charge the battery, increases the pull of the fine-wire coil.



Characteristic curves for generator on left and starting motors on right



Characteristic curves of small starting motor

When the voltage of the generator falls below that of the battery, so that the battery discharges into the generator, the reversal of excitation of this coarse-wire coil neutralizes that of the fine-wire coil until the circuit is opened by the spring pulling the armature away. Assuming now that a generator and such a switch are provided, and that the switch is closed, current will pass from the generator to the battery, due to the fact that the difference of potential at the generator is higher than and overpowers the voltage of the battery. As current flows, even though the speed be not altered, the difference of potential at the generator brushes drops because the flow of current is accompanied by a resistance loss in the armature, brushes, etc., so that the increasing flow of current is accompanied by decreasing generator potential and thus equilibrium is reached. If the generator speed be now increased, a correspondingly larger current flows into the battery unless other factors enter into the operation. One of these factors is due to what is known as the reaction of the armature. The flow of current in the conductors of the armature is such that its cylindrical iron core is powerfully magnetized and opposite sides of it become strong magnetic poles. Magnetic flux is set up in this iron armature in the same way that is set up in any other iron body magnetized by a coil. With ordinary position for the brushes, this magnetic flux of the armature, or armature reaction, sets up a magnetizing force at right angle to the magnetic flux produced by the field magnets. The intensity of this cross-magnetization is proportionate to the number of turns on the armature and to the current flowing through them; that is to say, the more the turns on the armature and the greater the current they carry, the higher this cross-magnetization will be. This disurbing factor produces a resultant flux which tends to be stronger at the trailing edge of each pole and weaker at the entering edge, so that the intensity of flux is no longer distributed evenly over the air-gap between pole surface and armature, but is crowded or denser near one side of the pole than the other. In addition to this distortion, some of the armature reaction is directly opposed to the main magnetic flux of the field magnet and opposes and weakens it; thus it comes about that the rising current flow through the armature is accompanied by a distortion and weakening of the magnetic flux, which originally produced the potential from which the flow of current arose. Therefore, when current is taken out of an armature, there is a drop of potential from brush to brush, caused partly by resistance drop in the armature and partly by a loss of effective magnetic lines resulting from armature reaction.

Regulation of Generators

With increasing speed and therefore increasing current, we do not reach the speed at which some kind of regulation must be used until the current becomes excessive, in spite of the factors which tend to hold it down. From this point on we will either have excessive current or have to do something to diminish the useful flux which the armature conductors cut. It is conceivable that we might use a generator having so many turns of small wire and such a poorly arranged magnetic circuit, that the resistance drop of the armature and the blowing-out of the magnetic flux might alone reduce the voltage with rising speed to such an extent that the generator would not overheat and burn up. But such a machine has losses which, while helping to save it from heating at higher speeds, prevent it from giving anywhere near a good output at low speeds. Therefore, we will continue to consider the usual generators having relatively few turns on the armature and these of ample cross-section. With such a machine, to prevent a rise of voltage in the higher ranges of speed, we employ some method of weakening the magnetic field. In a general way the field is weakened by some peculiarity in the construction of the generator, such that increasing current decreases field excitation. This is known as inherent regulation. If instead, the generator itself be of the plain shunt-wound type, the weakening of the field is accomplished by the action of a separate regulator responsive to either current or voltage, or both, this regulator being arranged to vary the strength of the exciting field current. This might be termed "regulator regulation."

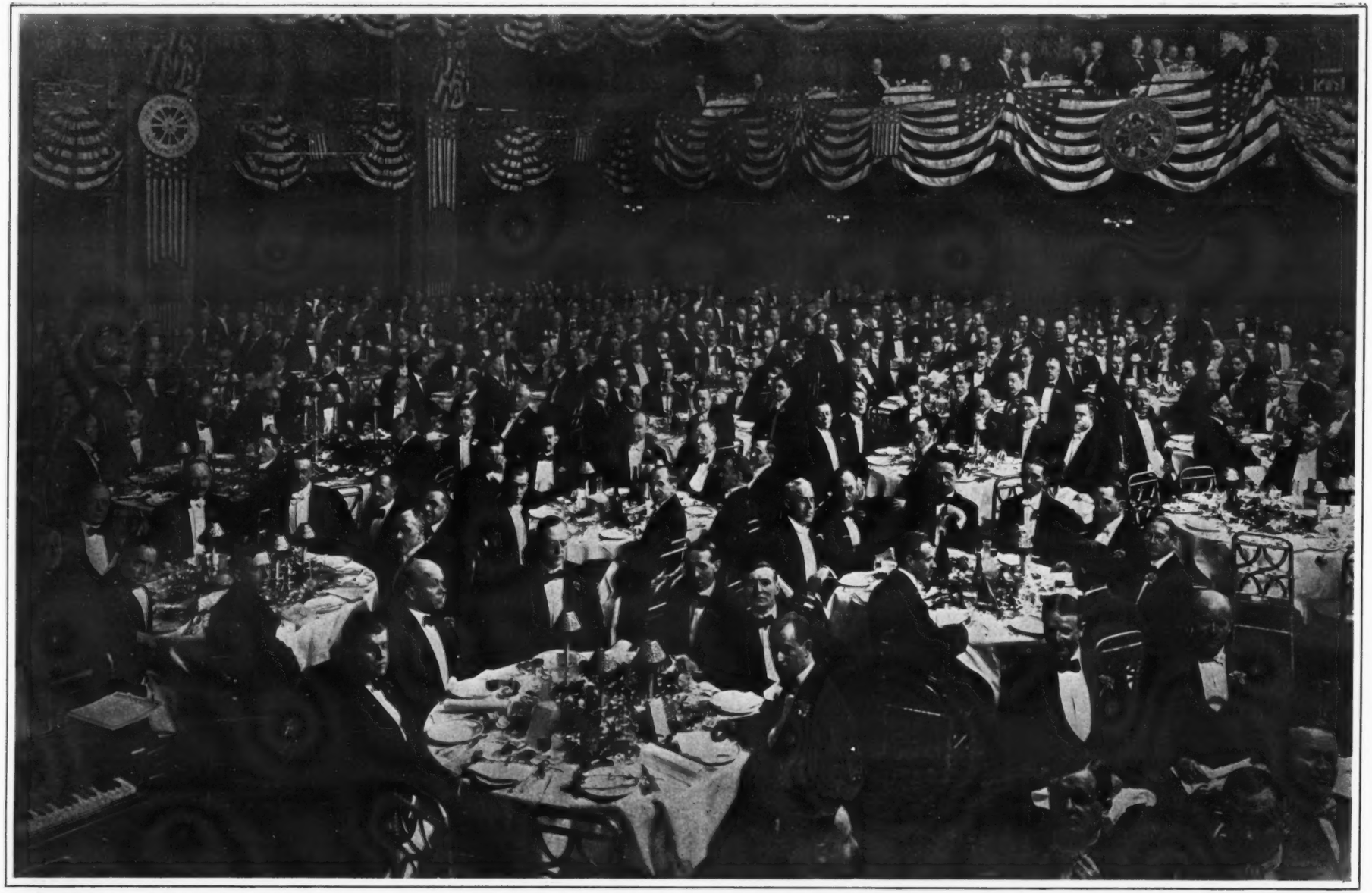
With inherent regulation it is difficult to make a construction in which the control of the machine is responsive to anything but current in some circuit, that is to say, either in the dynamo output circuit or in the battery branch circuit. To make such a machine regulate in response to its electrical potential alone, is so difficult or costly that machines of this type have not come into commercial use. On the other hand, when a separate regulator is employed, the regulator can be constructed to control the generator in response to either generator current or generator voltage independently of the generator current. Without at this time referring to the exact differences between the result when the generator is regulated purely in response to the voltage, and the result when it is regulated purely in response to current, it can be stated that the regulation in response to voltage alone has certain very attractive features. As just pointed out, this regulation cannot be accomplished with reasonable space and cost without using a separate regulator. On the other hand, if a separate regular is used, it can be made responsive to voltage alone in substantially the same space and at only slightly higher cost than if made responsive to current. Under these circumstances there is a tendency to regulate according to voltage whenever the circumstances warrant the cost of an independent regulator; whereas, if it is satisfactory to employ regulation responsive to current, this can be obtained without the use of a separate regulator and therefore without its cost and added parts; and in some respects the current regulation that can be had from certain types of inherently regulated machines, such as third-brush generators, is preferable to even the regulation obtainable from a separate "current" regulator. As a whole, the indication is that where the electrical load is large and the machine should be able to give out high amounts of current to take care of this load and to recharge a battery which has been subjected to this load, voltage regulation is desirable, even though it is attained at a somewhat higher cost. Where, on the contrary, the lighting load is not very high and the starting load and the drainage from standing idle constitute a larger factor in the total current consumption, current regulation can be employed to good advantage, especially when it is considered that generators for the purpose can be manufactured at less cost.

Factors Governing Size and Speed

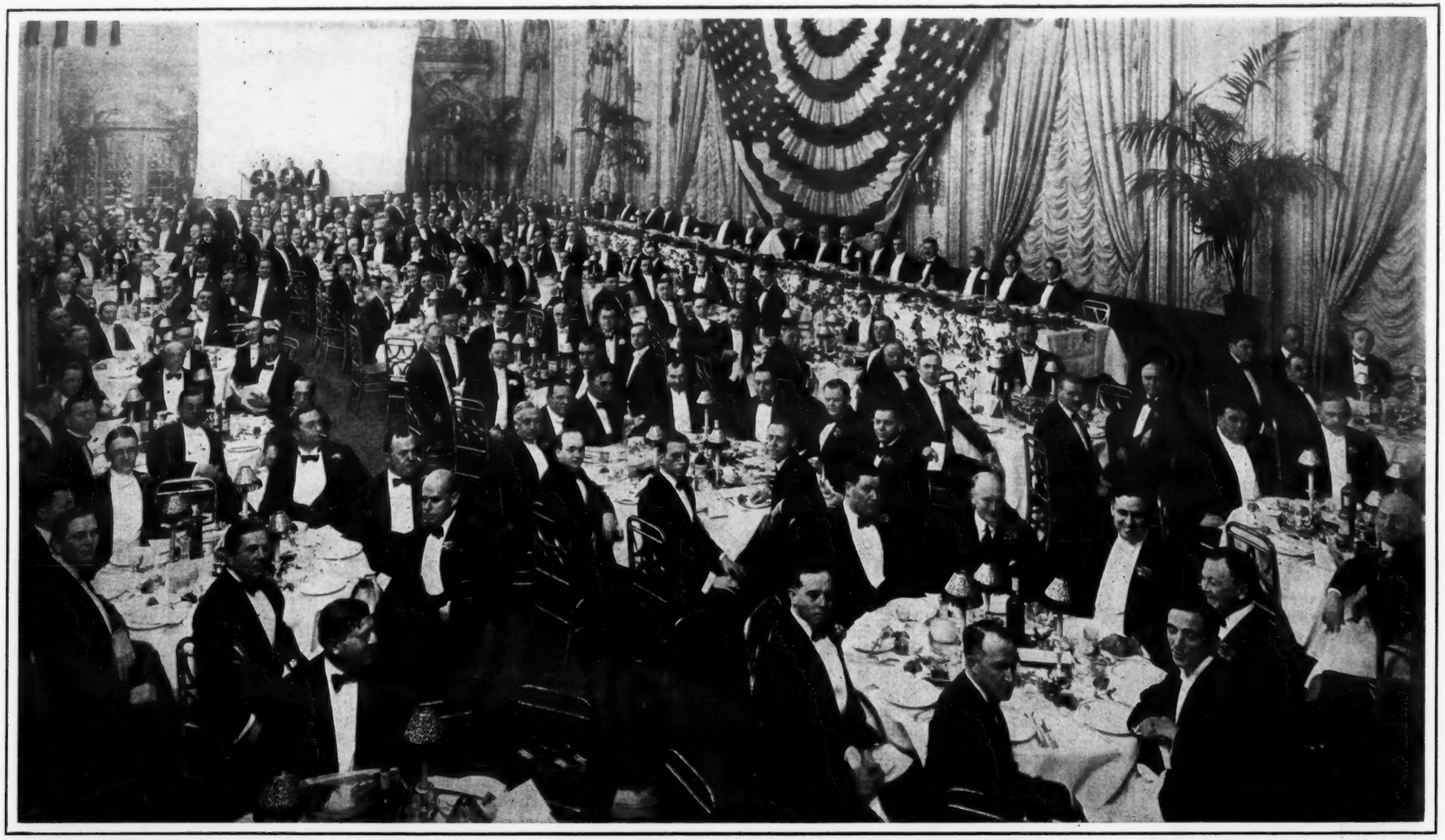
Regardless of the method of regulation, the generator size and speed must correspond to the conditions of the car to ensure adequate current supply.

(To be concluded)

S. A. E. annual dinner held Jan. 6 at Hotel Plaza, New York City. 550. Addresses were given by Secretary of the Navy Daniels and Major General Wood, U. S. A., Commander of the Department of the East. The number present eclipsed all previous records, reaching a total of



EIGHTH annual banquet of the Motor and Accessories Manufacturers' Association, held on Wednesday evening, Jan. 5, at the Waldorf-Astoria, New York City. This was the largest gathering in the history of the association, 450 being in attendance. There were no speeches whatever, with the exception of President Lovell's announcement to the effect that the evening was to be entirely devoted to sociability and the enjoyment of the repast and the cabaret entertainment provided, which lasted till nearly midnight.



ANNUAL banquet of the National Automobile Chamber of Commerce, Inc., held at the Waldorf-Astoria, New York City, Tuesday evening, Jan. 4. This was one of the largest gatherings of automobile manufacturers in the history of the chamber, 300 men being present as representatives of the majority of the industry. As Charles Clifton, president of the chamber, was absent, owing to illness, Wilfred C. Leland, of the Cadillac company, presided. Senator Gore, of Oklahoma, was the only speaker of the evening, and his subject was "Preparedness," which he discussed from its various angles and in different phases. The menu for the banquet was in the form of a stock certificate for 1000 shares in the Blue Sky Motor Car Co., incorporated under the State of Collapse. Another novelty was the decorating of John N. Willys, Harry W. Ford, George Kissel, and John F. and Horace E. Dodge with huge burlesque medals for various accomplishments in the manufacturing field. The medals were hung about the necks of the recipients by red ribbons.

The History of the American Automobile Industry—12

Increased Activity in Steam Vehicles Follows Pecqueur's Invention of the Differential and Modern Type of Steering Gear—Adverse Laws Smother Development in England

By David Beecroft

FOLLOWING the broad inventions of the Frenchman Pecqueur in 1828 of the differential as used to-day, of the modern design of steering gear and also the two-speed planetary gearset, there was a very general increase in the wave of steam activity. Pecqueur did much to blaze the road of future progress. His startling inventions set hundreds thinking and gave an atmosphere of practicability to the steam vehicle that it had not previously possessed.

In 1833 Richard Roberts patented in Great Britain the balance gear or differential shown by Pecqueur in France in 1828. This gear was also used by F. Hill, who in 1840 built vehicles weighing 4 tons with speeds of 12 to 16 m.p.h., which were known to make 20 m.p.h. on special occasions, and 128 miles per day over difficult roads were accomplished by Hills' coaches, which was twice as fast as horse coach speed, and the expense was claimed to be but half as much. His vehicles used wheels 6½ ft. in diameter.

It is often said that any new device may know it has arrived when the joke makers and comic artists take it up. So common did the motor vehicles become in this early period that George Cruikshank, London, who has been called the father of caricature, based a number of his funniest drawings on the new vehicle, about 1828 to 1830.

John Scott Russell, in England, best known as the designer and builder of the Great Eastern steamboat, made a small model steam automobile quite early, built a half dozen full-sized soon after, and in 1834 furnished the vehicles for a steam carriage company coach line. These vehicles carried from thirty to forty passengers. He attempted to improve the steam boiler, by making it light and staying its walls together, some of his boilers having as many as 1300 stays.

Red Flag Legislation

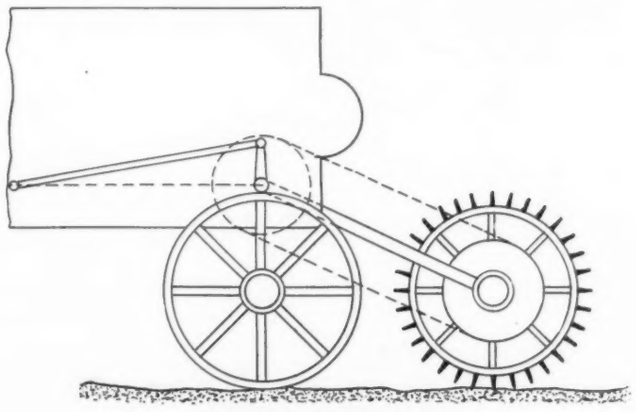
The high tolls imposed on motor vehicles in England, the constant objections of the vested interests represented by the coachmen and horse users generally, and finally a law which compelled each steam automobile to be preceded by a man carrying a red flag—all worked to suppress this promising movement with the result that although some inventors kept working, England practically disappears from the development of the automobile about 1845.

Several names appear in France keeping alive the movement there, among them being Dietz, who built an eight-wheel drag about 1834, driven by steam.

Doubtless political events had much to do with this cessation of mechanical vehicle development, but whatever the cause the steam vehicle for common roads languished. Occasional workers could not suppress their ambitions, so sporadic attempts were frequently found, but the great wave had subsided, and for the next 25 years little progress was made.

Begun as a carriage, developed into a coach, it diversified into the traction engine on the common road and the locomotive on rails. All the elements of the modern automobile that could be adapted to the traction engine or the locomotive had been developed to a fair degree of perfection during this period, so it is now possible to confine our consideration more closely to the light steam engine, to the velocipede or bicycle, to the gas engine, and to what may be termed carriage construction.

In spite of the drastic tolls and restrictive legis-



REAR-END PROPULSION

Many steam inventors were firm in their belief that some form of toothed wheel mounted back of the rear axle of a vehicle would prove the most satisfactory means of propulsion, many of these devices appearing between 1800 and as late as 1860. These rear driving wheels, resembling the paddle wheel on a Mississippi steamer, were driven by chain or belt, according to the ideas of the inventors

lation and the rapid acceptance of the locomotive and traction engine, the automobile idea did not wholly die. Occasional work in spite of the restrictions kept it alive, and about 1860 there was another wave of popularity, principally marked by the work of Rickett of Buckingham, who built a number of passenger locomotives, beginning about 1858. Most of these were of the type shown, having three wheels, of which the rear wheels did the driving and most of the load carrying. They weighed 3000 lb. and carried 1200 lb. of water and 300 lb. of coal. The boiler carried 130 lb. of steam pressure and fed a two-cylinder engine. At the rear was a place for the stoker and the forward seat was wide enough for three or four.

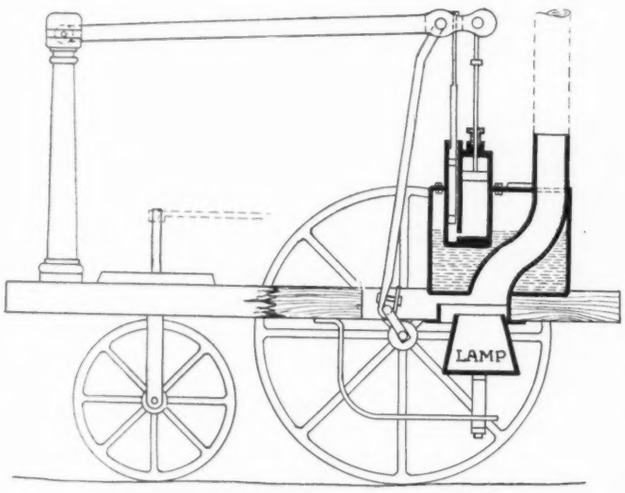
A 10-mile speed was common and grades of 10 per cent could be climbed by using the speed gear. One of these vehicles made 150 miles in 2 days in a very mountainous district and thoroughly proved its practicability. Rickett first used chains and sprockets but later used spur gears and finally connected the pistons direct to the driving wheels, as in a modern locomotive.

Steam Tractors in 1858

In 1858 Adamson & Co. of Manchester built for a customer a tractor for the purpose of hauling an omnibus. It had three wheels and ran at 8 m.p.h. Nine years later it was still in existence and had a race with a machine made by J. W. Boulton of Ashton. Boulton had built several of these and this one had a record of 90 miles in a day, carrying six to ten passengers and making no stops except for water.

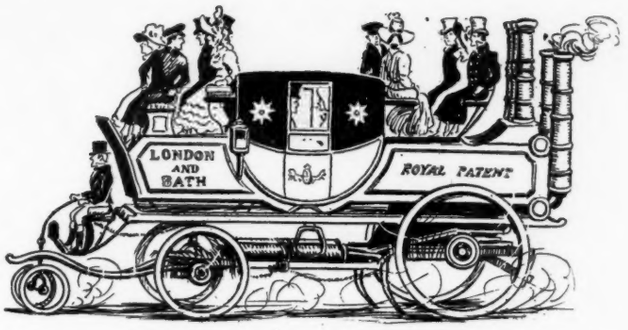
W. O. Carrett made a steam carriage in 1861 which was shown at an exhibition in 1862 and afterward sold to a London man who drove it about 800 miles, mostly at night to avoid conflict with the law. Later he rigged it up to resemble a fire engine and even provided firemen's suits for the passengers by which means he escaped interference for some months, but eventually had to give it up. It had a locomotive type boiler, carried 175 lb. of steam, the engine was geared to the rear axle which had a balance gear.

J. H. Knight constructed in 1868 a small two-cylinder vehicle weighing 3200 lb. and capable of 8 m.p.h. Its capacity was three passengers and the stoker, and it carried water for one hour and coal for three. It was afterward converted into a traction engine.



MURDOCK'S MODEL OF LOCOMOTIVE 1784

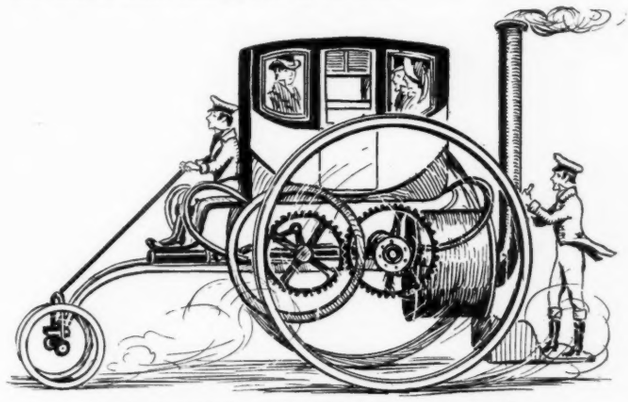
One of the early locomotives was that of William Murdock, a Scotchman, who was closely associated with James Watt in the development of the steam boiler. In 1784 Murdock built a small working model of a high-pressure locomotive engine illustrated herewith, which was satisfactory in performance. The lamp was located directly below the water boiler. In it is shown the vertical cylinder, in which is a piston connected to the overhead walking beam. From this beam a long connecting-rod coupled direct with a crank in the axle. It is interesting to note that Watt, although reposing the utmost confidence in Murdock, had no faith in the development of the steam carriage at that time and wrote that he was extremely sorry that Murdock was devoting his attention to it rather than attending to business which Watt considered of greater importance



GURNEY'S STEAM COACH OF 1827

One of the leading British inventors of steam vehicles was Goldsworthy Gurney, born in Cornwall 1793, and educated as a doctor. For several years he was a lecturer on chemistry and was a leading spirit in the highest scientific circles of his day. Besides turning his attention to steam vehicles he invented the oxy-hydrogen blowpipe, the limelight, and the steam jet for ventilating mines. He was responsible for the first lighting and ventilating system used in the British Houses of Parliament

His most famous steam coach, as illustrated herewith, was running in 1827. He carried twenty-one passengers, six inside and fifteen on the outside or top seat, some of which were in front and some in rear. It was a six-wheeler with the four main wheels practically the same as used on a horse-drawn vehicle and with two small steering wheels in front, which were guided by the operator, who sat very low in front with throttle and brake levers close at hand. This vehicle made a run of 6 miles in 35 min. and was able to climb hills at 5 miles per hour



TREVITHICK'S STEAM CARRIAGE OF 1803

To Richard Trevithick belongs the credit of producing the first practical steam vehicle illustrated herewith. He began his work in 1802, and had this vehicle operating the following year. His was the first attempt to provide a form of carriage for the passengers, although it remained for Griffith to develop what is known as the first comfortable vehicle for passengers. Trevithick made a number of journeys in this vehicle, averaging 8 or 9 m.p.h. for distances of 4 or 5 miles

The Rostrum

Says Designers Disregard Drivers' Comfort

EDITOR THE AUTOMOBILE:—During examination of cars at the New York show, I was particularly struck by the utter disregard of the driver's comfort as far as controlling the car is concerned. Most of the control levers are to be reached only with effort; and the hand brake lever frequently is at such a distance that one must leave one's position behind the wheel to reach it—or else pull it on with the foot.

Of course, this is caused by subordinating accessibility of the levers to ease in getting into and out of the seats. However, is it not more important to be able to control the car?

While modern trend toward eights and twelves may make gearshifting really unnecessary, all good drivers need the handbrake both for hilly city driving and fast driving anywhere. Hence, it should be easily reached, preferably without leaning forward to do so. A glance at the strained positions of passing drivers, some with both hands at the top of the wheel, others with elbows high and in similar grotesque positions, constantly requiring excess effort and sacrificing control, shows that it is just as impossible to make one car to fit everyone as it is to make one suit for all sizes of people. It is not expected that the same shotgun should fit everyone. On the contrary, makers recognize the variations in human architecture and supply corresponding variations in gunstocks to fit them. It is about time for the public to demand cars that are made to fit various types; shorts, and longs, stout and thin.

That this will add to safety is certain. That it will increase comfort and enjoyment is sure.

Deming, N. M. L. D.

Needs New Valve Tappets and Guides

Editor THE AUTOMOBILE:—The valve tappets on my Hupmobile model H-32 pump lubricating oil out of the base which is a big waste and a considerable loss.

Please advise if the valve spring covers could be made oiltight to prevent this waste of oil, and if so, please show how it can be done.

Abbeville, La. S. C.

—It is believed that studs could be so arranged and a cover made with a cork gasket whereby the valve spring compartment could be made oil tight, similar to the construction of the model N Hupmobile. However, a change of this kind has never been made, and the Hupmobile company is not in position to furnish parts, or prints showing how it could be done. It is suggested that you install new valve tappets and guides, to eliminate leakage of oil.

Clutch Brake is Set Too Tight

Editor THE AUTOMOBILE:—What causes free leakage of much oil from the transmission box of the latest model 32 Hupmobile and how may it be corrected? The oil leaks only after the engine has been in operation, will stop after a few ounces, more or less, has been lost and does not leak from the union of the propeller shaft housing but rather from the union between the transmission box and the universal joint housing.

2—What causes the clutch of the model 32 Hupmobile to stop the engine when the clutch is disengaged in effort to shift gears, and how may this be corrected?

When the throttle is most open and the engine is running at a speed of about 2500 r.p.m., it is possible to shift into low gear without killing the engine. The machine has been in use long enough to wear off the new but while this feature is better yet it gives much trouble.

3—How is oil prevented from entering the starting switch on the model 32 Hupmobile and how may the apparatus be inspected to see that oil does not enter same?

4—When the clutch springs of the model 32 Hupmobile are so near the flywheel that a wrench cannot be inserted how may the springs be adjusted? Some of the springs are all right and some are as far to one side as some are to the other.

5—How much play should recoil straps have to insure easy riding?

Graysonia, Ark. F. M. B.

—In the first paragraph of your inquiry you speak of an oil leak from between the transmission box and the universal joint housing. The model 32 is not constructed along these lines.

2—The clutch stalls the engine because the clutch brake is set too tight. This may be corrected by the clutch brake adjustment. This applies also to the latter part of the second paragraph in which you speak of running your motor in high speed and finding it impossible to shift into low gear without stalling the engine.

3—The switch is so constructed that the housing over the front end prevents oil or dirt from getting into the switch contact. No trouble is experienced from this source.

4—The Hupmobile factory furnishes the owner a special wrench with each car which is to be used for adjusting the spring tension in the clutch plate. This is a combination wrench and may also be used on the spark plugs.

5—It is impossible to answer this as you do not state what kind of recoil strap it is. The Gabriel Snubber has its adjustment made by the manufacturer of same and is set before being shipped.

Wants to Change Seating Arrangement

Editor THE AUTOMOBILE:—I would like to ask your advice in regard to changing the seating on my four-passenger 1912 Cole 4-40. It has too much room in front and not enough in the rear although it has 122-in. wheelbase. I would like to install two auxiliary seats.

1—How is the front seat fastened to the body, and would it be practical to move it forward?

2—The car is equipped with Gemmer steering, and could this be shortened? Would it do to move it up or is there a better way to change the length of the column?

3—As the gear shifter will be all right, is there anything else I might have to contend with?

4—Would this make any difference in the riding of the car?

Mishawaka, Ind. W. G.

—The front seat is built into the bodywork, including the sills and the side panels and it really is not a practical thing to do to cut this seat out and build another seat into the body farther forward. However, this seat could be cut away from

the bodywork and two seats could be set in the front part bolted to the floor and, if the owner desired, could be made adjustable, backwards and forwards.

2—Shortening the Gemmer steering gear is practical but it should be done by a first-class mechanic. It is not recommended that the gear be moved forward as it would entail a shortening of the fore and aft drag link, which is bad and it also would necessitate changing the front toeboard pedal arrangements, etc.

3—If you are satisfied with the gear shift locations, there is nothing else which would interfere with the body change.

4—The addition of the auxiliary seats and two passengers will evidently make the car ride easier but it will be necessary to add rubber bumpers on the rear end, to limit the play of the springs as they were not originally designed to carry this extra load.

Removing Carbon by Oxygen Satisfactory

Editor THE AUTOMOBILE:—I have two cars, a Buick six and a 1915 Ford and the young man who works for me has an oxygen carbon burning outfit which we have used on both to remove carbon, which process he learned in the Buick repair department. We had occasion to take the Ford to the local garage to take up the bearings and I noticed that the cylinders were all scored or all had longitudinal scratches on the walls which surprised me greatly, as the car has run but 700 miles and been carefully lubricated. Both the garage man and his assistant claim that every Ford or other car that they have observed that have had the process used are scored, especially Fords, finally admitting that he would not condemn its use except on a Ford.

Fenton, Mich. B. G. McG.

—If the oxygen burning machine is used in the proper manner by one thoroughly experienced in its manner of operation, it is not seen how it would affect these motors any differently than it would any other type of power plant. It is hardly believed that the scored cylinders have resulted from that work, although it is possible that the scoring dates back to the accumulations of carbon before it was removed, or perhaps the motor was run at some time or other with insufficient oil. It has always been the contention that the best way to remove carbon is by removing the head and scraping the deposits from the inside of the head and the tops of the pistons, as in that way only is it possible to give attention to the seating of the valves, which is of prime importance to the satisfactory operation of any motor.

Fitting Top to Kline Roadster

Editor THE AUTOMOBILE:—Kindly advise me where I could have a one-person top placed on my Kline roadster, model 1912, without sending it to the factory which is now located at Richmond, Va.?

Lopez, Pa. M. G.

—Any top maker in your vicinity can do this for you as the one-person sockets are now made by several forging companies. The top maker fills in a measurement blank and the proper sockets are then sent. The Kline company is supplied by the Cortland Carriage Goods Co., Cortland, N. Y.

New Cylinders and Pistons Needed

Editor THE AUTOMOBILE:—I have a 6-66 Pullman 1913, cylinders 4½ by 5½. At times there is a tap in the middle pair of cylinders. Not all the time. Will run along for miles without a tap, then tap for miles. It will tap going up hill but not on the level and then again it will not tap going up hill. Have had the motor taken down but could find nothing out of order, but have been told it was a side thrust or slap of the cylinder. It was there when the car was new and was told it was the tappet, but now I know better. I have come to the conclusion that a pair of cylinders does not get the proper lubrication. What would you advise? I am going to have new piston rings put in all the pistons and possibly a new middle block and pistons in place of middle pair of cylinders.

The later models of the Pullman 6-66 have a bore of 4¼, or 4⅜ by 5½, which made the middle wall of the pair of cylinders thicker. If I should put a pair of cylinders 4⅜ by 5½ what will be the result? The reason the bore of the later models were made smaller was to increase the thickness of wall between each pair of cylinders. I noticed that when the motor was taken down, the wall was thin and just a perceptible crack crosswise of the cylinder and below the water line.

Dover, N. H. H. G. H.

—You are correct in stating that the tap is not in the plungers, but lies in the cylinders and pistons. In 1913 the bore was changed to 4⅜, thereby increasing the walls of the cylinders which eliminates, to a great extent, the warping of them. The only real solution for this trouble that can be given is to have a complete set of 4⅜-in. cylinders and pistons placed in this car. It is not possible to use a pair of these and having the other two pairs 4½ in.

Use of Kerosene in Lubricating Oil

Editor THE AUTOMOBILE:—Will you please inform me whether kerosene would be injurious to the motor, commutator or magneto of the Ford car when used with lubricating oil, in the proportion of 15 to 25 per cent kerosene?

I have been using such a mixture for four months with a great deal of satisfaction. Before beginning the use of kerosene with the lubricating oil I had considerable difficulty in starting the motor when cold, and also experienced a great deal of trouble with carbonized spark plugs, cylinders and valves. I had the carbon removed from all parts of the motor before beginning the use of kerosene, but this did not remove the difficulty of starting the motor, besides the spark plugs would become carbonized in a few hours. I began the use of kerosene with the motor in bad condition, but the misfiring soon disappeared and I have had no trouble in starting the motor at any time. The car has been run 1500 miles since the carbon was removed from the motor, but it still functions like a new motor.

Washington, D. C. R. W. C.

—Kerosene can be used in some ways with good results, in the care of the Ford motor. However, we would not recommend mixing it with the motor lubricating oil. It is a good plan to use a 25 per cent mixture of kerosene with the commutator lubricating oil in cold weather so as to thin the oil sufficiently to prevent congealing on the commutator contacts which causes difficult starting of the motor. Also, we recommend draining the old oil from the crankcase approximately every 3000 miles, washing out the case with kerosene oil, draining that off and replenishing with fresh oil. It also is entirely practicable to remove the spark plugs when the motor is warm and put in a little kerosene in the spark plug holes which relieves carbon deposits to some extent.

In your case you are using a very heavy motor lubricating oil which, congealed between the clutch discs, causes trouble in starting the motor, and by putting in the kerosene you have thinned the oil sufficiently to eliminate that difficulty. Our idea is that the trouble can be traced directly to the grade of oil being used rather than to any condition which existed in the power plant. Taking this into consideration you will readily see that for general use it would not be practicable to put in kerosene with the motor lubricating oil, and if a proper grade of oil were used the kerosene would thin it entirely too much. You had better call at the Ford branch in your city and obtain oil that is adapted to the motor and that will enable you to discontinue your present practice.

Truck Design Shows Many Changes

(Continued from page 59)

remedy for this has been the division of the shaft at its middle, the fitting of three universals and a center bearing. An alternative to this has been the substitution of a tube for the usual shaft, the tube being much stiffer for its weight and strength than the solid shaft. The duty on the universals in long tubular driving members, however is more severe and so for success, rather more robust joints are required.

More Reserve Power in New Motors

This smaller and more compact unit power plant does not by any means signify that the truck of 1916 is not so powerful as that of 1915. On the other hand the efficiency of the motor and driving units has increased to such a degree that although the formula horsepower would show a falling off of several per cent, this would not be by any means a fair comparison. The motors of 1916 operate at higher rotative speeds following the same trend as in passenger car design. They are geared lower and the power curves of the motor extend to a higher peak than ever before and the result is that the motor has a greater reserve power for use on hills. The fact that the miles per hour speed allowed by the governors is just the same as last year shows that there is a greater factor of safety than ever before due to the fact that the trucks are not using in their regular duties anywhere near the ultimate horsepower of the motor. This is advantageous in two ways: first, it gives a greater reserve power for hills and rough roads and secondly, it increases to a notable extent the life of the vehicle.

Disk Clutch Gains 20 per Cent

In the various units which go to make up the drive of the truck there has been no change, shaft drive excepted, which is more noteworthy than the increase in the disk type of clutch. This has risen in one year from 28 per cent to 48 per cent. In other words whereas a year ago about one-quarter of the trucks had dry-disk clutches, at the present time they are fitted on nearly one-half the chassis. The cone clutch has fallen off from 42.2 to 26.3 and the disk in oil has dropped from 17.8 to 13.1. The fool-proofness of the dry-disk design and the ease with which it can be cared for are the two points that have recommended it to the designer of motor trucks, and it is probable that the use of this type of clutch will continue to grow in popularity. This is another trend which reflects that of the passenger car industry where simple clutches have come to be in great demand.

One point in which the tendency in truck design varies widely from that of passenger car practice is in the use of the four-speed gearbox. Whereas in the passenger car the four speeds have proved to be unnecessary with the lighter car loads, the higher-speed multi-cylinder motors, etc.; in the truck field, with the increasing capacity tendency there is an inclination to favor four speeds.

The development of the trailer, too, has resulted in designers looking with more favor on the multi-speed gearset, for the increased inertia imposed by the trailer requires an additional starting reduction. On hills, too, the additional load calls for a lower hill-climbing gear. The steps also need to be closer together, as they are in the four-speed design.

The result is that the percentage of trucks equipped with the four-speed gearbox is higher than it was for 1915. The respective percentages are 11.5 and 19.9 for 1915 and 1916. The difference in these percentages is made up by the drop in the three-speed gearbox which has fallen from 82 to 76.6. The use of the two-speed gearset is falling off.

Although the gear ratio average in 1916 is very slightly higher than that of 1915, a broader view must be taken than that which would be suggested by the averages of 8.66 to 1 and 8.75 to 1 which represent the practice for two years.

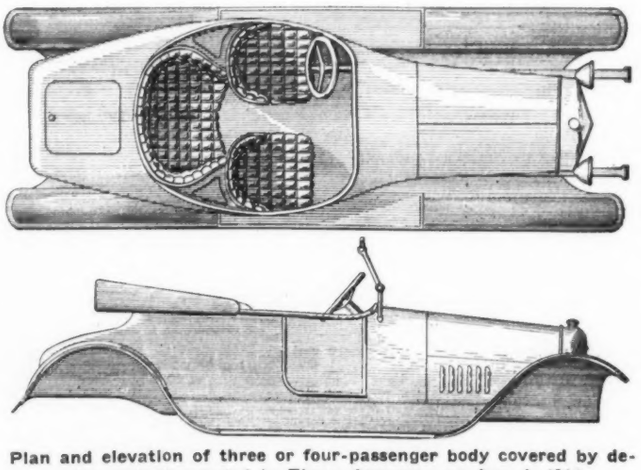
Simplification a Factor

It must not be understood that with the greater capacities the truck of 1916 is a heavier and more unwieldy vehicle than that of 1915. The contrary is the case and although the pay-load may be higher the weight of the chassis itself is, on the whole, less. This is due to the tendency toward simplification which is reflected in many ways throughout the car. The elimination of parts due to the employment of spring drive is a very good example of this. Last year the percentage of trucks which transmitted the drive through the springs was twenty-three. For 1916 this has increased to 47.3. The torsion strains are taken through the springs on 81 per cent. Practically every truck which takes the final drive through the springs takes the torque in the same manner and the percentage figure, for those using the spring drive, will hold good for Hotchkiss drive also.

Semi-elliptic springs seem to be the most favored way of carrying out the suspension. They are used on 88.4 per cent of the rear installations and 96.7 per cent of the front. Springs in general are longer and the suspension of the truck is easier on load and driver as a result.

Apperson Gets Design Patent on Clover-Leaf Body

NEW YORK CITY, Jan. 10—In view of the large number of three- and four-passenger roadsters of the clover-leaf type on the market, special interest attaches to the design patent on a body of this description granted to Elmer Apperson, Kokomo, Ind., and assigned to the Apperson Bros. Automobile Co., of that city. This design patent, which was granted Jan. 4 on an application filed Aug. 6, 1915, is No. 48,359 and its term is seven years. It specifies "a new, original and ornamental design for automobile bodies," as shown in the accompanying illustration, the construction being a streamline body for a left-steer chassis, the passenger compartment having a driver's seat and another seat with an aisle between them leading to the seat for one or two passengers in a horseshoe-shaped compartment behind the two front seats.



Plan and elevation of three or four-passenger body covered by design patent granted to Elmer Apperson on Jan. 4, 1916

The Automobile

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74,000 Trucks

THE production of motor trucks in America last year reached a total that is within sighting distance of the 100,000 mark. Of this large number a third were exported, but not all of that third went to do war work. Probably war purposes consumed about a quarter, and the difference represents trucks put to industrial purposes abroad.

Without question the most important phase of this export business is the part that is not government orders. Owing to the condition of the factories of Europe the American truck manufacturer has been able to get a decided footing in Great Britain, in France and in the many other parts of the world to which these two countries have been sending their trucks hitherto. These markets are not won completely, and it remains for the American makers to use their advantage to the utmost; they have their first success, and if it is to lead where it ought to lead they must push ahead just as fast as they are able.

With a home demand exceeding the supply and a foreign demand still more loudly clamoring for more trucks, 1916 can be faced with the probability that all previous production figures will be eclipsed. In a year from to-day the 74,000 that now looks so large ought, by rights, to have shrunk to very little in comparison with the 1916 output.

Settling Ignition Questions

HOW much stronger a thing is personal preference than scientific experiment; how difficult, in the face of prejudice, is it to get a scientific demonstration that is convincing to everyone! To-day nobody can say that the automobile ignition question is settled, nobody can see that the S. A. E. discussion has really brought us any nearer to determining the destiny of the magneto.

Taking the papers presented, of which each represents the conclusions of scientific research, it is obvious that the data collected is insufficient absolutely to settle the matter, yet it ought to be possible to *prove* the truth or otherwise of the conradictory contentions. Of course no laboratory experiment will settle a question complicated by commercial considerations, and that probably is the reason why it has taken so long to get a final ruling on the magneto-battery controversy. On and off, we have had it with us for twelve years now.

Tires Up 20 Per Cent

THE rise in the price of tires is one of those things which is always liable to happen in times of great disturbance. Practically everything the tire-maker needs costs more to-day that it did a short time ago. Rubber is up because of fear. Fear that the Suez Canal may be closed, fear that boats may be lost with valuable cargoes, fear on the part of both the plantation owner and the ultimate buyer. The reason for the present price of rubber is psychological, but it is also natural and not unreasonable. That the price will soon drop again is the general belief.

But rubber is not the only thing in tires which costs more. Certain compounds of zinc which are needed in the vulcanizing process are actually difficult to get, owing to the absorption of certain sources of supply by war. Zinc itself is short throughout the United States, so short that copper is getting to be cheaper than brass for some purposes. Cotton, too, of the special grades used by the tiremakers, is dearer and labor is certainly no cheaper, so if there is nothing to really account for the rubber price ruling to-day, there are plenty of things to explain the price of tires. Consumers can, however, rest with an expectation that the present prices are but temporary.

That rubber must cheapen again soon is as nearly certain as anything can be in connection with the romantic tropical product, and if rubber falls substantially the price of tires cannot but follow the fall.

Roadster Development

THE development of the roadster has suddenly taken a stride ahead in the past year. It was not long ago that the tendency of many makers was to drop the roadster from their lists. The new sociable seating giving three- and four-passenger capacity has again, and justly, put these vehicles in a position where they appeal to the popular fancy.

N. A. C. C. Cross Licensing in Force

Agreement on Exchange of Shop Rights of Members on Patents Effective Jan. 7

NEW YORK CITY, Jan. 10—Perhaps the most important event that occurred during show week in this city last week was the formal enforcement of the cross-licensing patent agreement among the members of the National Automobile Chamber of Commerce, Inc., which agreement went into force on Friday, Jan. 7. This cross-licensing patent agreement has been under organization for over a year, and by it the members hope to reduce very materially the amount of patent litigation among members.

Eighty of the ninety-seven members of the chamber have signed this voluntary agreement, by which they agree to give to the other seventeen members of the chamber shop rights on their patents. This agreement gives the other seventeen members six months in which they can enter into the agreement and share in the privileges.

Up to the present moment the N. A. C. C., through its able patent department, has examined and verified 353 patents controlled by the eighty companies that have entered into the voluntary agreement. This work of examining and verifying is still going ahead, and it is anticipated that well over 500 different patents will be represented in the cross-licensing agreement.

Two Classes of Patents

By the present scheme it does not mean that all patents owned by the eighty companies signing the agreement are pooled among the said companies and shop rights granted, but rather that patents are divided into two grand classes as follows:

Class A—Fundamental and basic patents, and particularly fundamental patents on motor trucks. These patents are not included in the cross-licensing agreement in that the purpose of the agreement is not to take away from any concern the value of basic and fundamental patents.

Class B—Patents relating to the general development of the industry are covered in the agreement. These patents have more to do with detail inventions rather than basic or fundamental patents.

New Detroiter Six for $1,098

DETROIT, MICH., Jan. 11—The Detroiter Motor Car Co., this city, has brought out a new five-passenger touring model called the Detroiter Six-45 and selling at $1,098. The Continental unit powerplant has block cylinders, which are 3¼ by 4½, and which have detachable heads.

Other features are: Auto-Lite starter with a Connecticut distributer separate from the generator with a variable spark, three-quarter floating axle, the differential being carried on ball bearings, and the wheels on roller bearings. Lubrication is force feed with pressure gage on dash. The clutch is multiple disk; the drive is Hotchkiss through vanadium-steel springs; tires 33 by 4; wheelbase 118 in. Equipment includes one-man top, windshield, Stewart speedometer, gasoline gage, electric horn, tire repair kit and tools.

Ford to Shorten Working Hours and Increase Wages

DETROIT, MICH., Jan. 12—*Special Telegram*—It is expected that important changes will be made in the working schedules of the Ford Motor Co. to take effect Jan. 15. Six hours will constitute the day's work instead of eight. There will be four shifts of six hours. Along with this shortening of hours, the minimum wage will probably be 50 cents an hour and those men now receiving $5 a day will be given $1 an hour, thus increasing their wage to $6 a day. It is likely that the system will be applied to all the Ford assembling plants and branches.

20,405 Cadillacs in 1915

DETROIT, MICH., Jan. 7—Cadillac cars having a value of between $41,000,000 and $42,000,000 were sold by the Cadillac Motor Car Co. in 1915. Exactly 20,405 eights were shipped between Jan. 1 and Dec. 31, 1915. A good many more should have been shipped before the year ended, but the shortage of freight cars was one reason why many purchasers were disappointed. There were also times during the past year when the general conditions of the material markets made it necessary to slow down production until the delayed supplies were received. At the present time there are about 7500 men working at the different plants of the company and from seventy to eighty cars are completed daily.

Knowles Is Saxon Chief Engineer

DETROIT, MICH., Jan. 11—*Special Telegram*—William H. Knowles, for the past year assistant engineer of the Saxon Motor Car Co., has been appointed chief engineer of the company to succeed R. E. Cole, resigned. Previous to his connection with Saxon, Knowles was for two years in the engineering department of the Timken company and later assistant to the chief engineer. He has been associated with the industry for about ten years, serving chiefly with the Warren and Corbin companies. He takes up his new duties at once.

Explains Proposed Gov't Tax on Cars

Sec. McAdoo States That Car Is Taxed But Once and at Factory Only

WASHINGTON, D. C., Jan. 11—Secretary of the Treasury McAdoo has issued the following statement: "The suggestion that tax on the horsepower of automobiles and other internal combustion engines might be considered by Congress, seems to be misunderstood in many parts of the country. A circular just issued by the California State Automobile Assn. and signed D. E. Watkins, secretary, illustrates this. The circular says that a Federal tax of 50 cents per horsepower on motor cars and 1 cent per gallon on gasoline 'Means to you each year nearly twice as much tax as you now pay. We now have men at Washington fighting this bill and are badly in need of financial support. Will you not join this club and help us defeat this unjust measure? If you do not feel that you can contribute $8 for a membership, then send us $1 or whatever amount you will. Now is when we need your support, so please give us an early response.'

Car Taxed at Factory Only

"The suggested tax on the horsepower of motor cars refers entirely to a tax on the automobile before it leaves the factory, to be paid by the manufacturer and paid once only, to the Federal Government; for instance, an automobile with a 20-hp. engine would be taxed $10 in the hands of the manufacturer. No yearly taxation of automobiles and motor trucks similar to the license taxes of States and municipalities is contemplated nor has it at any time been suggested that a Federal tax be imposed on automobiles already in use by private owners."

Vollbrecht Resigns as King V.-P.

DETROIT, MICH., Jan. 7—F. A. Vollbrecht, vice-president and general manager of the King Motor Car Co., Detroit, has resigned and has left the automobile field to engage in manufacturing in Detroit. Theodore E. A. Barthel has succeeded him. Mr. Barthel has been connected with the automobile field since 1902, when he joined the Olds Motor Works. Since then he has seen service with several of the large automobile concerns in the capacity of financial adviser.

Moreland Truck Prices Increased 5%

LOS ANGELES, CAL., Jan. 7—The Moreland Distillate Motor Truck Co., this city, has raised the prices on its trucks 5 per cent. This raise has been made on all models and will take effect immediately.

F. T. C. Concentrates on Gasoline

Commission Will Handle Exclusively Investigations of Reasons for Its High Price

WASHINGTON, D. C., Jan. 8—The latest development in the gasoline situation is the announcement by the Federal Trade Commission that it will handle exclusively investigations to determine the reasons for the high cost of gasoline. Several investigations now are being conducted by the commission to gather data which will enable it to tell whether the present high prices are reasonable.

In addition the commission is attempting to handle a number of complaints from all parts of the country charging discrimination in the price of gasoline. These matters are being handled directly by Commissioner Harris. The first complaints and the greater number of them came from the South and before Congress convened Commissioner Harris and a corps of assistants had gone to the southern States to make on investigation of the violations of the so-called Clayton act, which is the statute relating to price discrimination.

May Give Hearings

This side of the gasoline price probleb is considered by the commission to be a comparatively simple one compared with the investigations to determine whether the price charged is reasonable. Whether the commission will give hearings on the price discrimination phase of the problem has not yet been determined, but it seems probable that it will.

The only matter which the commission needs to help it in reaching a decision is data on refining and marketing costs. Many questions enter into the latter problem, including the determination as to whether more crude oil is being produced now than last year or in previous years; whether the oil is as productive of gasoline as oil taken in former years, etc. Labor costs, as well as depreciation of machinery used in the refining, also must be considered.

Replying to the Steenerson resolution calling upon the Department of Justice for information as to any action on the high price of gasoline, Attorney-General Gregory has sent the following communication to Congressman Webb, chairman of the house judiciary committee:

No prosecutions have been instituted by the government based on the increase of petroleum and its products, for the reason that no evidence has been developed as yet which would justify a charge that the increase is due to any action in violation of federal law. It is the duty of the United States district attorneys and investigators throughout the country to scrutinize closely all increases in the prices of stable commodities and to report promptly any evidence tending to show that such increases were brought about by agreement or combination. This duty has been particularly impressed upon them since the beginning of the European war, which has made it easier to find pretexts for increasing prices.

—

Opposes Steenerson Inquiry Resolution

WASHINGTON, D. C., Jan. 11—*Special Telegram*—Representative Carlin presented an adverse report from the House judiciary committee on the Steenerson resolution for an inquiry into the rising cost of gasoline on the ground that the attorney-general has answered question fully as stated above.

—

N. Y. Bankers Dine Willys

NEW YORK CITY, Jan. 11—A dinner was given last night at Sherry's in honor of John N. Willys, president of the Willys-Overland Co., by Elisha Walker, of William Salomon & Co., this city.

The occasion was unique, in that never before has such a gathering met to do honor to a leader of the automobile industry. It shows the importance of the place in the industrial world occupied by J. N. Willys in the opinion of prominent men of finance.

Among the sixty-three guests were: Frank A. Vanderlip, president the National City Bank and a director of the S. K. F. Ball Bearing Co.; E. H. Broadwell, vice-president of the Fisk Rubber Co.; Rathbone Fuller, L. G. Kaufman, president of the Chatham and Phenix National Bank, this city, and chairman of the finance committee of the General Motors Co.; A. P. Sloan, vice-president of the Hyatt Roller Bearing Co., Harrison, N. J.; Harry G. Fisk; H. T. Dunn, president of the Fisk Rubber Co.; Clarence A. Earl, vice-president and a director of the Willys-Overland Co.

—

Non-Motor-Stop Maxwell Ends Run—Covered 22,022.3 Miles

LOS ANGELES, CAL., Jan. 10—After running continuously for nearly forty-four days, and establishing a record of 22,022.3 miles, the engine of the non-motor-stop Maxwell has been officially stopped by Mayor Sebastian. It was immediately re-started and the car left for a tour through southern California and Arizona. The Maxwell's record replaces a former mark of 12,404.9 miles. The last day's run was made the longest and fastest of all, the car covering 562.5 miles in the twenty-four hours. The entire test was held under the sanction and observation of the contest board of the A. A. A.

Four Companies Raise Tire Prices

Empire, Falls, Globe and Pennsylvania Increase Rates 10 to 25 Per Cent

NEW YORK CITY, Jan. 12—Four more tire companies have raised their prices, the Empire list going up 15 per cent, the Falls 10 per cent, Globe approximately 25 per cent and Pennsylvania about 20 per cent. Kelly-Springfield announced an increase of 7½ to 26 per cent on its former list last week as reported in THE AUTOMOBILE for Jan. 6.

In every instance the reasons given for the higher prices are the scarcity and high market prices for the ingredients used in tire manufacture, crude rubber having risen from 57 cents a pound in September and October to 95 cents to-day. Similar high rates are found in Egyptian and Sea Island cotton and in zinc and sulphur. The great trouble seems to be that the manufacturers are not getting deliveries on materials, many of them being unable to procure the latter at contract prices, the shippers complaining that they are unable to get vessels to transport them.

The Globe company has not definitely decided what increase in its prices will be necessary but, like the other manufacturers, is endeavoring to keep the increase as low as possible.

Some of the new prices on Empire, Falls, and Pennsylvania tires are as follows:

Size	New	Old
EMPIRE		
30 x 3	$11.40	$9.90
34 x 4	24.05	20.90
34 x 4½	32.95	28.65
36 x 4½	34.65	30.15
FALLS		
28 x 3	15.50	14.50
34 x 4	32.75	30.50
37 x 5, non-skid	64.75	58.75
PENNSYLVANIA (All non-skid)		
28 x 3	15.65	12.65
30 x 3	16.60	13.00
30 x 3½	21.05	15.85
37 x 5	58.30	46.85

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Culbertson Sails for London

WICHITA FALLS, TEX., Jan. 6—J. G. Culbertson, treasurer and general manager of the Wichita Falls Motor Co., Wichita Falls, Tex., left New York, Dec. 31, on the steamship New York for London, accompanied by Frank Kell, vice-president of the firm. They will return sometime in February.

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Price with Rubber Products Co.

BARBERTON, OHIO, Jan. 10—H. A. Price, formerly with the B. F. Goodrich Co., and the Kelly-Springfield Tire Co. has been appointed sales manager of the tire division of the Rubber Products Co., this city.

Two Shows for Chicago

The Automobile Salon and National Show to Be Held Same Week

CHICAGO, ILL., Jan. 10—Chicago will have two shows during the week of Jan. 22 to 29, just as New York had two shows last week. In addition to the show of the National Automobile Chamber of Commerce at the Coliseum and First Regiment armory, there will be a salon held in the Auditorium Hotel, at which the following makes of cars will be exhibited: White, Simplex-Crane, Rolls-Royce, Lancia, Brewster and one or two others. These are practically the same makes that have been exhibited during the past week at Hotel Astor in New York under the name of the Automobile Salon, which has succeeded the Importers' Salon, the latter having been held in the same place in New York for many years. The show this year has had many more American cars than foreign makes, in fact, only five different makes of foreign cars were exhibited last week, whereas there were American cars of the following makes on exhibit: White, Packard, Locomobile, Cadillac, F. R. P., Simplex, Crane, Singer, Daniels, Owen Magnetic and Brewster. White exhibited at the salon, because it withdrew from the N. A. C. C. show because of differing with the association on the matter of drawing space. Many of the other exhibits of American cars, such as Locomobile, Cadillac, Owen Magnetic and Packard were made by the body builders and not by the companies themselves.

—

European War Beneficial to Italian Makers

TURIN, ITALY, Jan. 7—The effect of the European war on automobile and truck manufacture in this country has been beneficial. The industry, centered in Turin, profited by the increased demand for military trucks, both at home and abroad, and all of the plants were compelled to employ extra workmen and to introduce night shifts. This stimulation to an industry which had begun the year rather unfavorably offset to a large degree the depressing effects of the crisis in other local industries. The decree of Aug. 1 prohibited the exportation of automobiles, but exceptions were granted with a certain liberality in the case of medium weight and heavy trucks, so that the total value of the exports of motor vehicles was larger than in the preceding year, there being $7,849,695 in motor vehicles in 1914 compared with $6,596,921 in 1913.

The largest company, the Fiat, turned out 4800 automobiles in 1914, which is 1500 more than in the preceding year.

The future of this industry is promising, as the trucks lost in the war will have to be replaced and the local factories will be occupied for some time to come in supplying the demand. The exchange quotations of the shares of the Turin companies are given in dollars in the following table:

Companies	Nominal Value	Market Value, December, 1913	Market Value, December, 1914
Fiat	$10.30	$24.32	$24.32
Itala	4.82	9.84	7.72
Spa	4.82	5.21	5.50
Scat	4.82	4.15	4.82
Diatto Clement	4.82	2.30	2.70
Peugeot	4.32	.35	.....

The automobile coach-building industry, on the contrary, has been seriously injured by the war which has almost eliminated the demand for passenger cars and caused the exportation of this class of vehicle to cease. The cost of all supplies for this branch has greatly increased, particularly hides, varnishes, and cloths, as well as other accessories, which were previously supplied by England, Germany and France.

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U. S. Rubber Introduces Usco Tread and Royal Cord Tires

NEW YORK CITY, Jan. 10—Rounding out the line of the United States Tire Co. so that it comprises a tire for practically every need, the Usco tread and the Royal Cord tires have been put on the market, the former selling at a very slight advance on the plain tread prices while the latter lists at practically the same price as any other first-class cord construction.

The Usco tire uses a tread pattern made up of two rows of the letter U, one on each side of a plain strip in the center of the tread, the letters in each row being staggered in relation to those of the others. Another advantage of the Usco is said to be the special strength secured by a practically perfect union between the fabric and the rubber, the plies of the fabric being unified by rubber joined to the fabric.

The Nobby tread and Chain tread are continued by the United States company, and commercial vehicles are provided for by the new Pressed-On truck tire recently announced.

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Scripps-Booth Capital Stock Increased to $350,000

DETROIT, MICH., Jan. 7—The Scripps-Booth Co. has increased its capital stock from $150,000 to $350,000, for the purpose of enlarging its plant and increasing its manufacturing facilities. The company has elected Clarence H. Booth vice-president and managing director.

250,000 See New York Show

Largest Attendance of Any Exhibition Held in That City—Sales Big

NEW YORK CITY, Jan. 10—The sixteenth annual automobile show held in held in New York City closed Saturday night after a week of record-breaking attendance and sales, approximately 250,000 persons, or 33 1-3 per cent more than last year, inspecting the 326 cars and chassis as well as the 290 accessory exhibits on display in the Grand Central Palace. This is the largest attendance recorded for any automobile show, horse show or other great exhibition ever held in this city. In fact, during the entire week, hotels were over-crowded and theaters overwhelmed with demands for tickets. Never have the huge hostelries of the metropolis experienced such a rush of business with the exception of the week of the Hudson-Fulton celebration. And the tremendous crowd which came to see the show, to sign new contracts, buy cars and negotiate for replenishment of accessory stocks contained 40 per cent more dealers in cars than were in evidence at the 1915 show.

The exhibitors themselves were delighted with the sales made, new agents obtained, and general business done and, practically to a man, declared the week to have been one of unprecedented success as compared with the shows of previous years.

Business-Like Atmosphere

The atmosphere of the show this year was more business-like than has ever been the case. More people seemed to come to the show with the intention of buying a car than ever before and the questions of visitors at the various booths were in every case evidence of the greatly increased familiarity of the general public with the essentials of construction and the performance to be expected from the cars of to-day. These questions reveal marked attention to details which in former years were passed over without comment. The dealers state that the great improvement in business confidence over the corresponding period a year ago was reflected in the attitude of the show visitors, who seemed to have more ready money and to be more inclined to spend it than at that time. More retail sales are reported than ever before, practically every exhibitor having sold a number of cars while some of the more popular low-priced makes reported many sales each day.

From the dealers' standpoint the show has netted more live prospects for immediate and spring delivery of cars than

any previous exhibition, in fact, some exhibitors sold more cars last week than in an entire month of the past year. In addition many new contracts were signed and much new territory covered for 1916. Practically all the dealers predict a big shortage of cars for next summer's selling season. The attendance of dealers at the show was much better than expected, men coming from as far south as Florida and as far west as Omaha, St. Louis and Kansas City with a few from the coast. As to the individual exhibitors' opinions of the show, these may be realized from the statement that the sales made vary from 40 to 600 per cent in excess of those at any previous show.

Accessory Exhibitors

In the accessory field it is the same story over again. Though here the sales made during the week were in most cases comparatively small, the general interest shown the new contracts secured and territory distributed served to make the net business gain far above that attained at last year's display.

Laurel Four for $750—Six to Come Later

RICHMOND, IND., Jan. 7—The Laurel Motor Car Co., this city, announces a new four-cylinder car to sell at $750, and soon will have ready a six that will sell somewhat under the $1,000 mark. Specifications of the four include a block motor with cylinders measuring 3 by 4¼ in., rated at 22.5 hp. Under brake test the motor is said to give 31.9 hp. at 2,000 r.p.m. The bearings are unusually large, the crankshaft front bearing being 1½ by 3⅞ in., center, 1⅝ by 2¼ and rear, 1⅝ by 4 in. The oiling system is a combination force-feed and splash, with revolving sight feed on dash, to which the oil is forced by a plunger pump. This sight feed is provided with an oil line leading the oil back to the three main bearings of the motor and then runs into the stamped steel oil tray. Cooling is by thermo-syphon.

The motor has a detachable cylinder head, and the clutch is a single disk in oil. Three speeds forward are offered, drive is left and control levers in the center.

Body design is conventional, the rear seat being 48 in. wide and the upholstering is heavy and of good material. Among the equipment is found one-person top, demountable rims, speedometer, electric starting and lighting, electric horn, etc.

Linerd Resigns from Ajax-Grieb

NEW YORK CITY, Jan. 11—J. B. Linerd, sales manager of the Ajax-Grieb Rubber Co., this city, has resigned to become president and general manager of the Bourne Chemical Corp., also of this city. No successor has been appointed.

550 Attend S. A. E. Banquet

Engineers Hear Officials of Army, Navy and Automobile Industry on Preparedness

NEW YORK CITY, Jan. 7—One of the most successful banquets ever held by the Society of Automobile Engineers was given last night at the Hotel Plaza, approximately 550 being present. The speakers included Secretary of Navy Josephus Daniels, Major General Wood, U. S. A. Commander of the Department of the East, and Alfred Reeves, General Manager of the National Automobile Chamber of Commerce. The dinner was presided over by William VanDervoort, president of the society.

Preparedness the Keynote

Preparedness was the keynote of the addresses given at the close of the banquet. President VanDervoort first addressed the members, extending a welcome and reviewing the accomplishment of the society. He pointed out the peculiar fitness of the Society of Automobile Engineers to be an efficient aid to the Government in time of war and peace and assured the Government that the society is willing to not only extend words expressing intentions, but would also be ready to take officers of the Navy and Army into the plants of the manufacturers for the purpose of instructing them in the intricacies and economics of manufacture.

General Wood delivered a brief speech, in which he brought out the necessity of the organization of industries to support the fighting arm of the service. He compared the situation to that of a heavy sword in which the keen edge is the first line of fighting proof, but in which the mass of metal which enables the edge to acquire the desired strength and stiffness is the industrial resources of the country. The better organized this industrial group is, the more efficiently can the keen cutting edge be kept in its proper condition.

Need of Truck Standards

An important point brought out by General Wood in his address is the need of standardization of the motor truck. He stated that the Army did not desire a miscellaneous mass of different sizes and varieties of vehicles to aid in transportation problems, but rather a standard form of vehicle upon which replacements would be easily made. He also said that he hoped an Army consulting board similar to that recently created for the Navy would soon be formed.

Secretary Daniels stated that the Navy department would assuredly appreciate the opportunity of sending officers to the automobile factories for the purpose of securing technical information, and it is probable that, beginning with the coming spring, squads of officers will be sent to the automobile factories. The need for a good aeroplane motor was mentioned by Secretary Daniels, who pointed out that the automobile engineers would be the logical men to develop it.

Considerable time was spent by Secretary Daniels in pointing out the necessity for an adequate Navy in this country, and the evident indorsement of the members of the S. A. E. present was shown by the enthusiastic reception of Secretary Daniels' expression of views.

The Motorists' Part

Alfred Reeves, general manager of the N. A. C. C., spoke of what the automobilist should do in time of war. He pointed out to General Wood that the 240,000 automobiles in the State of New York alone should move 1,000,000 men over the roads at an average speed of 30 m.p.h. There were about 550 at the banquet, and among the prominent guests were William McClellan, vice-president of the American Institute of Electrical Engineers; C. C. Hanch, director of the National Automobile Chamber of Commerce; William L. Saunders, president of the American Institute of Mining Engineers; Dr. J. S. Jacobus, president of the American Society of Mechanical Engineers; Howard E. Coffin and A. L. Riker, both of the Naval Consulting Board and members of the Society of Automobile Engineers; W. H. VanDervoort, president of the society, and A. J. Hemphill, president of the Automobile Club of America.

M. & A. M. Directors and Officers Re-elected for 1916

NEW YORK CITY, Jan. 6—At the twelfth annual meeting of the Motor and Accessory Manufacturers, held at the Waldorf-Astoria yesterday, the following were re-elected as members of the board of directors: F. Hallett Lovell, Jr.; C. E. Thompson, A. P. Sloan, Jr., and C. E. Whitney. W. M. Sweet continues as manager.

At the meeting of the board of directors held in the association's offices today, the officers whose terms had expired were re-elected to serve for an additional year. They are as follows: President, F. Hallett Lovell, Jr., Lovell-McConnell Mfg. Co., Newark, N. J.; first vice-president, C. W. Stiger, Stromberg Motor Devices Co., Chicago, Ill.; second vice-president, C. E. Thompson, the Steel Products Co., Cleveland, Ohio; third vice-president, T. J. Wetzel, the Dyneto Electric Co., New York City; treasurer, L. M. Wainwright, Diamond Chain & Mfg. Co., Indianapolis, and A. P. Sloan, Jr., Hyatt Roller Bearing Co., Newark, N. J.

National Acme Takes Windsor Machine

$3,500,000 Deal Practically Closed—Details to Be Decided at Jan. 20 Meeting

CLEVELAND, OHIO, Jan. 10—The negotiations by which the National Acme Manufacturing Co. of this city is to acquire the business and plant of the Windsor Machine Co., Windsor, Vt., have been practically closed. The deal involves about $3,500,000. The capital stock of the local company will be increased to take care of this addition, but any further amount will not be decided upon until the annual meeting is held on Jan. 20. The details will then be worked out for the consolidation.

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Portage Rubber Profits Increase 46½ Per Cent

BARBERTON, OHIO, Jan. 6—The financial report of the Portage Rubber Co., made public at the annual stockholders' meeting, showed net profits from operation of $129,000 for the year 1915, which is 46½ per cent above those of the previous year. The sales amounted to $1,100,000, an increase of 62½ per cent over 1914. The usual quarterly dividend of 1¾ per cent on the common stock of the company was declared.

Officers elected were: James Christy, president; M. S. Long, vice-president; W. J. Anderson, secretary, and W. W. Wildman, treasurer.

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Overland 1915 Earnings Estimated at $10,000,000

TOLEDO, OHIO, Jan. 10—Willys-Overland earnings last year amounted to $10,000,000, according to a circular sent to the holders of the preferred and common stock. This amount is equal to over 9½ times the preferred dividend requirements on the $15,000,000 issue and equal to 45 per cent on the common stock. The average surplus for the 3¼ years ended Sept. 30, was $6,893,622, or six and one-half times the annual dividends on the new $15,000,000 in convertible 7 per cent preferred stock issue.

The proceeds of the new issue will be applied in retiring existing $4,483,700 preferred stock, and to the general funds of the company. The new convertible preferred stock is exchangeable from Jan. 1, 1917, to Jan. 1, 1922, into common stock at 300. In the event that additional common stock is issued as a dividend or at prices less than $300 per share, the conversion price is to be proportionately reduced. The company is to set aside, on or before July 1, each year, commencing with 1917, a sum equal to 3 per cent of the par value of the preferred stock as a sinking fund.

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Markets Easier

NEW YORK CITY, Jan. 12—Market prices last week were easier. Prices on those commodities which have seen violent rises during the past few weeks, either remained constant or were lower. Steel prices were unchanged, though the demand by the manufacturers was as urgent as it has been during last month. Lead and copper, however, continue to rise, the former closing yesterday at $5.90 per 100 lb. and the latter at 23½ cents a pound. Tin, on the contrary, dropped yesterday to $41.50 per 100 lb. This metal has always been subject to violent changes, however, and so the latest reduction cannot be taken as a mark of further reductions.

The rubber market was quiet last week and prices were somewhat lower. Para, which earlier in the week reached the $1 mark, declined to 96 cents, yesterday, and Ceylon pale crepe likewise saw a reduction and closed at $1.03. The demand for rubber last week was weak as was that in London.

Gasoline in this city went up another notch in its unprecedented climb toward new high marks, quoting at 22 cents a gallon. The increasing price of gasoline has brought benzol as a substitute into greater prominence. In many parts of the city last week, it was noted that garages displaying on signs the price of gasoline, had posted a roughly painted number—usually 25 cents—over the former price, as if the new price were merely temporary, and another and higher price might be quoted the next day. Benzol as a substitute for gasoline has been the subject of the evening at a number of meetings held in this city lately, especially at the Chemists' Club, recently, where it was stated that with the present immense production of benzol the cost has been reduced until now it is believed that it can be manufactured and sold at a profit at the proportionate price of gasoline, and that this will be done after the war is over. Proportionate price means that, when it is considered that benzol has a motive power about 25 per cent greater than gasoline, it would consequently have 25 per cent advantage at the same price.

Aluminum Shortage Grows

The scarcity of materials has hit many of the manufacturers. Especially is this true in aluminum. Manufacturers of motors and parts in and around Milwaukee, it is said, are apprehensive of a serious shortage of that metal and report that already there is a necessity for returning to the use of cast iron parts because of the soaring prices and the added difficulty of getting a sufficient supply. A shortage of high speed steels is also reported and the restricted supply of tool steels, coupled with greatly increased prices, may prove a hardship during the coming year.

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Thomas Receivers File Report

BUFFALO, N. Y., Jan. 8—The receivers of the E. R. Thomas Motor Car Co., this city, have filed their report in which they state that the total receipts of the receivership have been $512,025.23; the claims filed aggregate slightly more than $1,000,000, on which there have been paid dividends aggregating 30 per cent. There is now cash in the hands of the receivers amounting to $39,938.88.

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Chicago Gasoline Prices Reduced

CHICAGO, ILL., Jan. 7—Gasoline prices in this city have dropped to 16½ cents, nearly 2 cents. The Standard Oil Co., it is said, is responsible for the low price.

Reports from the Oklahoma and Texas oil fields state that there is an oil famine and that the oil wells in those two States have slumped in production from 35 to 50 per cent. Gasoline prices, as a result, it is predicted, will reach in the near future 40 cents a gallon and oil by-products will be 35 to 40 per cent higher than at any time in the history of the United States.

Advances of 1 cent a gallon in wholesale gasoline prices were put into effect in the entire eastern territory last week,

Daily Market Reports for the Past Week

Material	Tues.	Wed.	Thur.	Fri.	Sat.	Mon.	Week's Ch'ge
Aluminum	.53	.53	.53	.53	.53	.53	...
Antimony	.40	.41	.41	.42	.42	.42	+ .02
Beams and Channels, 100 lb.	2.07	2.07	2.07	2.17	2.17	2.17	+ .10
Bessemer Steel, ton	33.00	33.00	33.00	33.00	33.00	33.00	...
Copper, Elec. lb.	.23	.23½	23½	.23½	.23½	.23½	+ .00½
Copper, Lake, lb.	.23	.23½	23½	.23½	.23½	.23½	+ .00½
Cottonseed Oil, bbl.	8.81	8.78	8.80	8.74	8.80	8.82	+ .01
Cyanide Potash, lb.	.28	.28	.28	.28	.28	.28	...
Fish Oil, Menhaden, Brown	.48	.48	.48	.48	.48	.48	...
Gasoline, Auto, bbl.	.21	.22	.22	.22	.22	.22	+ .01
Lard Oil, prime	.92	.92	.92	.92	.92	.92	...
Lead, 100 lb.	5.75	5.75	5.75	5.90	5.90	5.90	+ .15
Linseed Oil	.66	.67	.67	.68	.69	.69	+ .03
Open-Hearth Steel, ton	34.00	34.00	34.00	34.00	34.00	34.00	...
Petroleum, bbl., Kansas, crude	1.20	1.20	1.20	1.20	1.20	1.20	...
Petroleum, bbl., Pennsylvania, crude	2.25	2.25	2.25	2.25	2.25	2.25	...
Rapeseed Oil, refined	.93	.96	.96	.96	.96	.96	+ .03
Rubber, Fine Up-River, Para	1.00	1.00	.97	.97	.97	.96	— .04
Rubber, Celyon Pale Crepe	1.05	1.05	1.04	1.04	1.04	1.03	— .02
Sulphuric Acid, 60 Baume	1.50	1.50	1.50	1.50	1.50	2.00	+ .50
Tin, 100 lb.	44.50	44.50	44.50	42.50	42.50	41.50	—3.00
Tire Scrap	.05½	.05½	.05½	.05½	.05½	.05½	...

following the advances on the Pacific Coast.

The New York City price to garages is now 22 cents a gallon, which compares with a price of 12 cents on March 31 last. The same schedule is effective for Standard Oil of New York territory in Long Island and Connecticut. In other New England States the price is 1 cent higher at 23 cents.

The schedule for New Jersey is 21 cents; for Ohio 19 to 21.

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Bowen Resigns from Locomobile—To Build Automobiles

NEW YORK CITY, Jan. 12—Frank H. Bowen has handed in his resignation as sales manager of the local Locomobile branch. He is at present engaged in the promotion of a scheme to build automobiles.

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Gier Pressed Steel Co. Now

LANSING, MICH., Jan. 7—The name of the Gier & Dail Mfg. Co., has been changed to that of Gier Pressed Steel Co. The concern started in business in July, 1909, with a capital stock of $35,000, making among other things metal stampings and steel products.

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Regular Dividends Declared

United States Rubber Co.; quarterly on first preferred of 2 per cent and on second preferred of 1½ per cent, payable without closing of transfer books, Jan. 31.

Ajax Rubber Co.; quarterly of $1.25 per share; payable March 15 to stock of record Feb. 28.

Security Prices Lower

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General Motors Drops 35 Points —Studebaker Drops 6— Maxwell Lower

NEW YORK CITY, Jan. 12—Automobile and accessory issues last week suffered a setback in prices, due to a downward movement in quotations on the Stock Exchange and an inactive market. The decline last week of those stocks which have seen new high marks was a keen disappointment to those who have money invested in those issues. General Motors common, especially, has declined during the past two weeks. On Saturday it quoted at 455, just 83 points under its high mark on Dec. 13. Notwithstanding the adoption of a 20 per cent dividend rate and the declaration of a 5 per cent dividend for the last quarter of 1915, in addition to 5 per cent for the current quarter, the stock closed 35 points under last week's quotation. The decline depressed other stocks.

Willys-Overland common dropped 6 points to 226 as did that of Studebaker, which closed at 159. Maxwell common, first preferred and second preferred, declined 3½, 2 and 1 points, respectively. Chalmers also went down to 125 with a 5-point loss. Chevrolet closed at 126, just 4 points lower than last week's quotation. Reo Motor Car dropped 2 points to 30 as did White, which closed at 49½.

Firestone common, Peerless, J. I. Case and Goodrich preferred, were the only stocks to make any appreciable gains during the week. Firestone went up 10 points to 720; Case rose to 85; and Goodrich went up 1 point to 113. Ajax dropped 1½ points. It is claimed that current earnings of the Ajax company are at the rate of more than 25 per cent per annum on the company's $3,000,000 outstanding capital stock.

Detroit issues also declined last week, General Motors, Studebaker, and Maxwell showing the largest drops. General Motors common went down to 445 with a 12½-point loss; Studebaker quoted 7 points under last week's quotation and closed at 159½; and Maxwell common was 5¼ points lower, quoting at 69½.

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Hercules Is Now Dixie Motor Car Co.

LOUISVILLE, KY., Jan. 7—Complying with the will of a majority of the stockholders of the Kentucky Wagon Works, ratified at a meeting several days ago, to conduct an automobile manufacturing plant in connection with the regular business of the concern, officers yesterday filed articles of incorporation of the Dixie Motor Car Co., the capital stock of which is fixed at $150,000, divided into 1500 shares of a par value of $100, two-thirds of which is common stock fully subscribed, and one-third preferred stock.

The articles are in the nature of an amendment to the Hercules Sales Co., in which the name is changed to the Dixie Motor Car Co., and the amount of capital stock increased from $100,000 to $150,000, the owners of the capital stock of the old concern becoming the owners of the common stock of the new. Incorporators of the new concern are P. S. Tuley, C. D. Kelso, W. E. Massey, A. H. Ross, J. R. Duffin and R. V. Board.

Automobile Securities Quotations on the New York and Detroit Exchanges

	1915 Bid	1915 Asked	1916 Bid	1916 Asked	Wk's Ch'ge
Ajax Rubber Co. (new)	..	..	70	71	—1½
Aluminum Castings pfd	95	100	..	..	..
J. I. Case pfd	..	85	85	88½	—2½
Chalmers Motor Co. com	..	97	125	150	—5
Chalmers Motor Co. pfd	..	93½	101	103	..
Chevrolet Motor Co.	..	..	126	130	—4
Electric Storage Battery Co.	..	..	64	65	..
Firestone Tire & Rubber Co. com	348	352	720	..	+10
Firestone Tire & Rubber Co. pfd	109½	111	112	..	—1½
General Motors Co. com	84	85	455	465	—35
General Motors Co. pfd	92	94	114	..	..
B. F. Goodrich Co. com	26	27	73	75	—1
B. F. Goodrich Co. pfd	92	95	113	114	+1
Goodyear Tire & Rubber Co. com	188	191	340	343	—2
Goodyear Tire & Rubber Co. pfd	100¼	101¼	114	..	..
Gray & Davis, Inc., pfd	..	..	..	..	..
International Motor Co. com	..	..	20	25	—5
International Motor Co. pfd	..	..	40	45	—5
Kelly-Springfield Tire Co. com	75	77	*292 / †73	295 / 74	—3 / —1
Kelly-Springfield Tire Co. 1st pfd	79	80	94½	95½	+ ½
Kelly-Springfield Tire Co. 2d pfd	95	100	† 73	74	—1
Maxwell Motor Co. com	17½	18	71	73	—3½
Maxwell Motor Co. 1st pfd	48	49	90	91	—2
Maxwell Motor Co. 2d pfd	18	20	55	57	—1
Miller Rubber Co. com	..	..	260	270	..
Miller Rubber Co. pfd	..	..	113	115	..
New Departure Mfg. Co. com	110	120	..	..	..
New Departure Mfg. Co. pfd	102	..	..	..	..
Packard Motor Car Co. com	..	100	185	195	..
‡Packard Motor Car Co. pfd	93	..	102½	104	+1
Paige-Detroit Motor Car	..	..	..	700	..
Peerless Motor & Truck Corp.	..	..	30	31	+3
Portage Rubber Co. com	33	36	70	72	..
Portage Rubber Co. pfd	80	85	102	105	..
Regal Motor Co. pfd	..	..	..	20	..
§Reo Motor Truck Co.	11½	12¼	23	25	..
§Reo Motor Car Co.	24½	25½	30	32	—2
Splitdorf Electric Co. pfd	..	..	..	..	..
Stewart-Warner Speed. Corp. com	52½	53½	87	89	..
Stewart-Warner Speed. Corp. pfd	100	102	108	..	..
Studebaker Corp. com	36	37	159	161	—6
Studebaker Corp. pfd	91½	92½	110	113½	—3
Swinehart Tire & Rubber Co.	69	71	89	90½	..
Texas Co.	133	134	227	229	—3
U. S. Rubber Co. com	57½	58	56	57	—1
U. S. Rubber Co. pfd	102½	103½	109	110	..
Vacuum Oil Co.	198	201	230	235	..
White Motor Co. (new)	..	..	49½	50½	—2
Willys-Overland Co. com	86	90	226	229	—6
Willys-Overland Co. pfd	90	95	111	112½	— ½

OFFICIAL QUOTATIONS OF THE DETROIT STOCK EXCHANGE

ACTIVE STOCKS

	1915 Bid	1915 Asked	1916 Bid	1916 Asked	Wk's Ch'ge
Chalmers Motor Co. com	..	97	..	153	—3
Chalmers Motor Co. pfd	..	93½	..	102	— ½
Continental Motor Co. com	165	..	247	255	—3
Continental Motor Co. pfd	..	..	91	94	..
Ford Motor Co. of Canada	445	..	..	410	..
General Motors Co. com	84	86	445	480	—12½
General Motors Co. pfd	92½	94½	113	115	—1
Maxwell Motor Co. com	17	19	69½	72	—5¼
Maxwell Motor Co. 1st pfd	48	50	89½	91½	—2½
Maxwell Motor Co. 2d pfd	19¼	21¼	53½	56½	—1½
Packard Motor Car Co. com	..	100	..	190	—2
Packard Motor Car Co. pfd	93	..	103	104⅛	— ⅛
Paige-Detroit Motor Co. Co	..	..	..	700	..
§Reo Motor Car Co.	24¼	25¼	32⅛	33⅛	— ⅛
§Reo Motor Truck Co.	11⅛	..	22¾	23¾	— ¼
Studebaker Corp. com	36	38	159½	162½	—7
Studebaker Corp. pfd	91¼	93½	112	115	..

INACTIVE STOCKS

	1915 Bid	1915 Asked	1916 Bid	1916 Asked	Wk's Ch'ge
§Atlas Drop Forge Co.	..	25	28½	31	..
Kelsey Wheel Co.	185	..	295	..	+10
§W. K. Prudden Co.	19¼	20¼	30	34	+3¾
Regal Motor Co. pfd	..	25	..	20	—2½

*Old. †New. ‡And accrued dividends. §Par value $10.

A. B. C. Ford System Is Effective

Two Unit Disposed in Novel Manner—Motor of High Cranking Power

NEW YORK CITY, Jan. 10—The outstanding novelty in the A. B. C. electrical starting and lighting system for Fords to be made by the A. B. C. Starter Co., Detroit, Mich., as announced last week, is the location of the cranking motor. This is usually the most troublesome part of a Ford system, as if it operates through a chain the latter needs some attention, and if it connects to the crankshaft it must stand in front of the radiator.

The A. B. C. motor lies alongside the crankcase near the right front where it is entirely out of the way. Integral with its casing is an inclosed gear reduction looking something like the timing gears of a small gasoline motor and this case is of course quite narrow. The small pinion of the gear train is on the starting motor shaft and the large gear is of such a size that it comes in line with the crankshaft, the inclosing case bolting to the front frame member so that the gears come beneath the radiator where their case is concealed by the license tag.

On the spindle of the large gear there is a Bendix pinion, but instead of being a toothed wheel the pinion part is formed just like the starting jaw of a hand crank. Thus, when current is switched into the motor, the gears begin to turn, the Bendix "pinion" jumps forward and the jaw takes hold of the Ford crankshaft just exactly as the old hand crank used to do. The reducing gear gives lots of power and the control is a switch.

For the generator drive a belt is used after the manner which has proved so successful on the Maxwell. There is a pulley on the crankshaft and the belt passes round the fan and the generator, giving an easily tensioned triangular drive. The generator locates on the front left side of the engine, fairly high.

For controlling the output of the generator a Ward-Leonard controller is employed. The system as supplied includes everything, a battery which fits on the left running board, wiring for headlights and tail lamp, dimmer switches, etc.

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17,300 Paige Sixes for 1916

DETROIT, MICH., Jan. 10—At the annual meeting of the stockholders of the Paige-Detroit Motor Car Co., it was announced that during the fiscal year 1915, which ended Aug. 31, nearly 8000 Paige cars were made and sold. For the 1916 fiscal year the production schedule calls for 17,300 cars. The profits of the company during the past fiscal year were nearly 430 per cent greater than in 1914, and the earnings 130 per cent on the capital stock. The production schedule is being maintained at the rate of 150 cars a day, but provisions have been made in all departments to enable the output to be 300 cars a day on a ten-hour working basis. Conditions throughout the country as reported by Paige dealers and distributors are the best the company ever had. The demand is steady and on an increase in every section of the country.

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Goode Leaves Paris Branch of Packard Motor Car Co.

PARIS, Dec. 24—R. N. Goode, manager of the Paris branch of the Packard Motor Car Co., severs his connection with that firm on Jan. 1. No arrangements have been made for a successor, and it is understood that the Paris office will be closed, at any rate temporarily. This will not interfere with the Packard truck business in France, which is handled direct between the factory and the French army. Mr. Goode, who has had charge of Packard interests in Paris for the last five years, and is well known to American visitors to Europe, has linked up with Gaston, Williams and Wigmore, Ltd., and in conjunction with his brother, Keith Goode, will have charge of the French and Italian markets for that company.

Take American Truck Agencies

F. Charron, one of the founders of the Charron and the C. G. V. automobile companies, now president of the Alda Automobile Co., has taken up the agency in France for the Federal truck. Charron's factory at Courbevoie, near Paris, is almost completely occupied on shells, only a few touring cars being built; thus the truck agency is a side line.

Another French automobile manufacturer is about to take up the agency for the U. S. truck. The Jeffery company has opened a spare parts depot at Neuilly, in the suburbs of Paris, to give service in connection with its Quads.

At the present time there is a demand in France for trucks for civilian uses which local manufacturers are unable to meet, owing to the demands of the war department. Practically all private trucks were requisitioned by the army months ago, and users, after being content with temporary measures for a time, are now looking around for permanent relief.

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Fire in Chevrolet's Tarrytown Plant

TARRYTOWN, N. Y., Jan. 7—Fire due to spontaneous combustion in a testing shed of the Chevrolet Motor Co., at Kingston Point, to-day did damage estimated at $50,000. The building, a one-story brick structure, 100 by 65 ft., was gutted.

Omaha Sales Show 100% Gain

Car and Accessory Dealers Optimistic—Many Enlarge Distributing Quarters

OMAHA, NEB., Jan. 7—An increase of 100 per cent in the automobile business for the past year in Omaha—acknowledged third largest automobile distributing point in the United States, by the way—is taken by local dealers and distributors as a reasonable ground upon which to base an estimate of the progress of the industry in the entire country.

The steady enlargement of quarters, the removal in many instances of dealers and distributors to new locations with immensely increased stocks and facilities, with the building of several new houses during the year, are all taken as measures of prosperity.

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Bour-Davis Co. Formed

DETROIT, MICH., Jan. 10—The Bour-Davis Motor Car Co. is a new Michigan corporation with a capital stock of $500,000, organized by Chicago men to manufacture a low-priced car here. The incorporators are prominent business men of the Windy City, but this seems to be their first venture in the automobile industry. They are Robert C. Davis, engineer for the Chicago, Duluth, Lake Superior Steamship Co.; Charles J. Bour, well-known in advertising circles in Chicago; and E. C. Noe, general manager of the Chicago Elevated railway system.

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To Fight Bill for Yearly Registration in D. C.

WASHINGTON, D. C., Jan. 8—A bill introduced in the House by Congressman Cary, of Wisconsin, provides that on and after July 1, 1916, it will be unlawful for any person to operate any motor vehicle within the District of Columbia without having first obtained from the automobile board a certificate of registration and number plates. The color of the plates is to be changed each year and the horsepower of all engines or motors is to be computed.

The license numbers will expire at midnight on June 30 of each year. The fees provided by the bill are as follows: For each motor vehicle with a rating of 10 hp., $5 per year; more than 10 and less than 20 hp., $10; more than 20 and less than 30 hp., $15; more than 30 and less than 40 hp., $20; 40 hp. or more, $25. It is provided that the automobile board may issue to a dealer or manufacturer of motor cars a certificate of registration and number plates not to

exceed four sets, upon payment of $6 for each set.

All cars used by the United States Government and the District of Columbia are to be provided with license plates free of charge. All members of Congress are to be exempt from the provisions of the proposed law, providing they have complied with the laws in their respective States. All privileges shall be accorded to the residents of other States as are accorded by law to residents of the District of Columbia.

It is expected that motorists will put up a strong fight against the Cary bill.

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Dodge Bros. Get Injunction on Use of Name

DETROIT, MICH., Jan. 7—To-day the Wayne County Circuit Court issued a restraining order in favor of Dodge Bros. against the Dodge Motor Car Co., whereby the latter cannot use the name Dodge in connection with the manufacturing of its cars.

Dodge Bros. filed suit against the Dodge Motor Car Co. in August, 1914, because this concern which had started in business in July of that year, was using the name Dodge on its cars. The company was promoted by Alvan M. Dodge, who was formerly with the Wahl Motor Car Co. Dodge Bros. claimed that the new company was trying to profit by the name Dodge, which had then been well known for a period of twelve years.

While the Dodge Motor Car Co. made a few cars, it ceased to manufacture a few months after it had started in business.

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Marvin Batavia Rubber Treasurer

NEW YORK CITY, Jan. 10—New York capital will aid the Batavia Rubber Co., with factories at Batavia, N. Y., and sales and financial offices recently established in this city, in extending and developing its business, Charles F. Marvin, formerly of Blake Bros. & Co., having become treasurer and a member of the board of directors, and George W. Hodges, of Remick, Hodges & Co., having also been added to the board of directors. Both will henceforth take an active interest in the company. They succeed O. C. Carpenter and Horace F. DeCamp of this city. There is no other change in the personnel of the company.

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H. A. L. Leases Royal Plant

CLEVELAND, OHIO, Jan. 7—The Harry A. Lozier Co., this city, has leased for a short term the Royal Motor Car Co. plant along the Lake Shore tracks west of Gordon park. Within two weeks the manufacture of the H. A. L. twelve will have begun. The first car manufactured was on exhibition last week at the New York City automobile show. It is stated that a permanent site for the plant is now being negotiated for.

15,000 Overlands for Kansas City

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Big Allotment To Be Handled in Enlarged Territory by New Branch

KANSAS CITY, MO., Jan. 7—The Willys-Overland Co., Toledo, Ohio, has taken over the local agency as a factory branch and installed S. W. Ramsey, who for the past two years has had charge of the sales department here, as branch manager. The territory to be served from Kansas City has been enlarged by the addition of the States of Arkansas, Oklahoma, New Mexico and parts of Nebraska and Oklahoma to Kansas and the portion of Missouri that formerly was handled from here.

The establishment of the factory branch here will mean an actual investment by the Willys-Overland Company of approximately $1,000,000 in real estate and buildings. Recently the building now occupied by the agency at 2110 Grand Avenue and 95 ft. of vacant property north of it was purchased for $250,000. As soon as possible work will start on the construction of a six-story building to occupy the entire 135-ft. frontage on Grand Avenue.

In addition, it has been given out that a 5-acre tract on the Belt Line will be acquired and a building with approximately 500,000 sq. ft. of floorspace will be erected as storage quarters. The present structure on Grand Avenue and the new building to be erected there will be used only as a show room and shop and not for storage purposes. The Belt Line property will be necessary for the storage uses.

The year just ended found the Kansas City agency distributing approximately 5000 cars in Kansas and western Missouri. With the addition of three whole States and parts of two others it is believed at least three times that number will be handled from here and the factory has allotted 15,000 cars to Kansas City as its 1916 quota.

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80 Per cent of Packard Output Sold—Factory Works Day and Night

DETROIT, MICH., Jan. 10—"Our manufacturing schedule calls for 7750 twin-sixes for this fiscal year," said Sales Manager H. H. Hills, of the Packard Motor Car Co., and of this number 80 per cent have been contracted for. At the rate orders are coming in from our dealers, distributors and branches, we could dispose of an additional 5000 cars. In addition to those 7750 cars we will build a very large number of trucks, but here again conditions, which we cannot overcome now, will not make it possible to produce the number that could be sold. We are doing everything possible to increase our production. We are adding to our working force, we are making extentions to the plant, more equipment and other necessities to increase production are being added, and yet we cannot keep pace with the demand. Many departments are being worked with day and night shifts and the truck department especially has orders now which will keep it busy day and night for several months."

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Austin-Cadillac Suit Ends

DETROIT, MICH., Jan. 4—Judge C. W. Sessions of the United States district court in Grand Rapids, Mich., to-day signed the final decree in the Austin-Cadillac two-speed axle case.

It was on Jan. 8, 1915, that the judge rendered a decision in favor of Walter S. Austin, of the Austin Automobile Co., Grand Rapids, granting the latter's demand for an injunction and damages against the Cadillac Motor Car Co., ordering an accounting so that the amount of damages could be fixed.

The parties since then had agreed upon a form of decree, and it is this decree which now has been confirmed by the judge and signed by him and thus brings the case to an end.

Suit was started by Mr. Austin in July, 1914. He claimed that the Cadillac company infringed his two-speed axle patent, No. 1,091,618, which had been issued to him in March, 1914.

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Hyatt Employees Form Class in Iron and Steel Metallography

HARRISON, N. J., Jan. 11—Employees in the physical testing laboratory of the Hyatt Roller Bearing Co. factories have organized a class in the metallography of iron and steel. The course consists of correspondence lessons prepared by Professor Sanveur of Harvard and is supplemented by letters and practical examples taken from the regular shop work. The course consists of two lessons a week and will continue over a period of six months.

Tuition is charged for the course but any employee remaining with the company two years will have his tuition refunded to him. The Hyatt company has permitted the use of its metallographic apparatus for the carrying on of the work and prizes will be offered for the greatest progress.

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Missouri Dealers Want Lower Fees

ST. LOUIS, MO., Jan. 8—A strong movement for the reduction in the price of State automobile licenses has appeared among automobile dealers in St. Louis. The present system, they say, has had a deterrent effect on automobile

sales during the closing months of the closing year.

Every automobile owner in Missouri must take out a license each year, the cost of which varies from $2 to $12, according to the horsepower of his car. The cost of a license is the same no matter when taken out, so that short-lived license is just as expensive as one which has a full year to run.

Plans are being made by automobile dealers to influence the next General Assembly to establish a license graded according to the time it covers.

"I know five automobile prospects who have put off the purchase of a car because they were unwilling to pay a full year's license for a few months' use of their car," said Frank R. Tate, president of the Tate-Gillham Motor Car Co.

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Form Wolverine Tractor Co.

DETROIT, MICH., Jan. 10—The Wolverine Detroit Tractor Co., is being formed here to manufacture a motor tractor which is to sell at from $800 to $900. The promoters of the company are W. G. Wagenhals, formerly vice-president of the Wagenhals Motor Co., who is the designer of the tractor, and W. J. McNamara, former mayor of Edmonton, Alberta, Canada, and reputed to be the owner of more than 20,000 acres of farm land in that section of Canada. Temporary offices have been opened at 664 Grand Avenue. The tractor is to appear at the Detroit show, Jan. 15 to 22.

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Banner Buggy Co. Reduces Its Capital to $400,000

ST. LOUIS, MO., Jan. 5—Simultaneous with the beginning of operations at the new St. Louis Chevrolet assembling plant the Banner Buggy Co., part of whose plant was converted into an automobile factory, has announced a decrease of its capital stock from $700,000 to $400,000. Russell F. Gardner, president of the buggy company, is also president of the recently incorporated St. Louis Chevrolet Co.

Mr. Gardner has converted a large portion of his buggy factory into an assembling plant and turned out the first St. Louis-made Chevrolet "Four-Ninety" on Jan. 1. The local plant, Mr. Gardner says, is to supply the entire Southwest and Middle West with Chevrolet cars.

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King Resigns from Jones

WICHITA, KAN., Jan. 6—W. A. King, general factory manager and consulting engineer of the Jones Motor Car Co., this city, has resigned, his resignation to take effect Feb. 15. He has accepted a position with a new organization now being formed to build cars. He will hold the same position that he is holding at present with the Jones company.

A. A. A. To Pick Master Driver

Contest Board Will Also Select Master Car for 1916 Racing Season

NEW YORK CITY, Jan. 10—The contest board of the American Automobile Association has tentatively decided to select the master driver and master car in the 1916 speedway and road-racing circuit, thus following the example set by *Motor Age* during the past several seasons of selecting the master or winning driver for road racing and also for speedway racing. Plans are yet chaotic, but the suggestion has been made to award the driver so distinguished with a gold medal, carrying his profile on the front and a suitable inscription on the rear, and to further give him $500 in gold. The complete details of the scheme will be worked out in the near future by the contest board.

During the past year *Motor Age* awarded the speedway supremacy to Gilbert Anderson, piloting a Stutz car, and road-racing supremacy to Earl Cooper, also driving a Stutz. The minor speedway circuit was awarded to Edward Rickenbacker in a Maxwell. In making these awards the two invitation 100-mile speedway races won by Resta were not considered because of their invitation nature. It was necessary to establish a major speedway circuit made up of Indianapolis, Chicago, New York and Minneapolis, and a minor circuit of smaller tracks where shorter races for smaller purses were offered.

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Miller Is Vice-President of Miller, Hicks & Hewitt

NEW YORK CITY, Jan. 11—Roland Van G. Miller, formerly sales manager of the Hune Carriage Co., Boston, Mass., has been elected vice-president of Miller, Hicks & Hewitt, manufacturers of automobile bodies in this city.

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Austin Heads Dry Climate Tire

DENVER, COL., Jan. 7—The Dry Climate Tire Mfg. Co., Denver and Arvada, has elected E. A. Austin, of Boulder, president to succeed C. W. Clark; A. L. Davis, Arvada, director and vice-president, and W. H. Davis, Fort Lupton, secretary. The recently organized firm has a factory at Arvada and sales office in Denver.

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Auto Wheel to Add 100 Men

LANSING, MICH., Jan. 5—Within the next two or three weeks additions to the plant of the Auto Wheel Co. will be completed and about 100 more men will be added to the working force, bringing the force up to about 300 men. Business in 1915 was the best the company ever had, and orders now on the books from regular customers will keep the plant busy until August. Recently new housings were erected, and it is said that the company now has about 1,000,000 ft. of lumber stored.

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Reo Starts Night Work

LANSING, MICH., Jan. 10—Night work was started at the plant of the Reo Motor Truck Co. a few days ago. A force was put to work in the automatic screw machine department and from now on night shifts will be added in other departments. These night workers work 14 hr. a day during five days. The day workers, who work six days a week, work only 10 hr. a day.

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Velie Sales Gain 400 Per cent

MOLINE, ILL., Jan. 10—In spite of having been somewhat held back by the materials situation, the Velie Motor Vehicle Co., this city, states that its car sales for November were 400 per cent greater than a year ago. Further plans for manufacturing expansion are now under way.

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South Dakota Fees Now Only $3

PIERRE, S. D., Jan. 7—Several changes are noted in the new automobile tag license law. The fee is $3. Formerly it was $6 per year payable in two bi-yearly installments. A discount of 50 per cent on the license fee for cars operated five years or more has been done away with.

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Allen Motor Co. Expands

FOSTORIA, OHIO, Jan. 6—The Allen Motor Co., this city, has increased its capital stock from $100,000 to $1,500,000. Of the new capitalization $500,000 is preferred stock all of which has been taken by Cleveland capitalists. The additional capital will be used in making improvements on the plant.

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Limberg Buys Delage Racer

PARIS, Dec. 31—Carl Limberg, who is now in Paris, has closed a deal with the Delage company for the purchase of one of their 1914 Grand Prix racing cars. The car has been purchased conditional to the government permit to export being obtained. It is not believed that there will be any difficulty in getting this permit. The car is one of the sixteen-valve type with positively closed and opened valves. It is Limberg's intention to run it in the Indianapolis and other American races next season.

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10,000 Kings for 1916

NEW YORK CITY, Jan. 7—The King Motor Car Co., Detroit, will build 10,000 cars this year, according to plans announced this week.

Corona Wants Grand Prix

International or Corona Grand Prix May Be Held March 17

LOS ANGELES, CAL., Jan. 5—Corona may hold a race in 1916. There remains but 2 miles of the highway from Los Angeles to Corona to be completed and permission has already been granted by the city trustees for a race on the course.

There is but one condition under which the race is to be run. There must be no appearance money paid for drivers. This is a case of civic pride and the trustees require the directors of the Corona Racing Association to sign a guarantee not to offer any appearance money before the race is allowed to be advertised.

The $15,000 subscribed last Fall when the Corona race was first suggested, is still in the hands of the officers of the association.

According to Chairman Kennerdell, the Corona race will not be a road race this year but a boulevard race. This is a new classification insisted upon by the Chairman of the Contest Board on the grounds that the Corona course was originally designed for speed although it is a public highway.

The next race on the Los Angeles speedway is to be held Feb. 22 and the Corona date, according to supporters, will be March 17. There is some hope of making it a high grade match by getting the International Grand Prix for the course, the Vanderbilt going to the New York Speedway. In case the Corona boosters are unsuccessful in getting the International Grand Prix, the event will be known as the Corona Grand Prix.

2-Mile Speedway for Cincinnati

CINCINNATI, OHIO, Jan. 7—Cincinnati is to have a 2-mile speedway within six months, according to plans of the Cincinnati Speedway Co., organized here with a capital of $500,000 of which $400,000 has already been subscribed. At a meeting of the board of directors last Saturday authority was given to purchase a tract of land 1 mile long and 1½ miles wide near Sharon, Ohio, and lying close to the Big Four, Pennsylvania and Cincinnati, Hamilton and Dayton Railroad lines. There are four improved pikes surrounding the track on which it is planned to erect the new speed saucer. At the Saturday meeting it was understood that the architect, Henry Hake, accompanied by his engineer, Captain Charles Kuck, was to leave within a week to make an inspection of the New York and Chicago speedways.

The plan of construction of the Cincinnati track is to use 2 by 4-in. planks laid lengthwise. There is to be a clubhouse on the field and it is planned to hold military tournaments and general athletic contests on the course as well as automobile races. Through the transportation facilities at the disposal of the company it expects to be able to handle 100,000 persons in half an hour. It is pointed out that 1,500,000 persons live within 100 miles of Cincinnati, which should insure good attendance. The plans for the course are to be ready by February, much of the preliminary work having already been done.

The officers of the speedway are E. W. Edwards, president; Harry Lehman, vice-president, and T. J. Davis, treasurer. The directors, in addition to the officers, are M. J. Freiberg, R. K. Le Blond, J. P. Orr, I. J. Cooper, A. E. Burkhardt, W. T. Foley, T. J. Corcoran.

Elgin May Lose Road Races

ELGIN, ILL., Jan. 7—Elgin may lose the national road races. Negotiations are pending between the Chicago Speedway Assn. and the Elgin Road Race Assn. over a proposition to hold the 1916 races on the Maywood Speedway. F. W. Jencks, general manager of the Elgin events, has arranged for a conference with D. F. Reed, president of the speedway association, to go over the details of the proposition and will present them to the Elgin directors for their consideration. The Elgin association has the option of renting the speedway and taking entire charge, or taking a guarantee from the speedway association and the latter assume the management. Elgin directors hesitate about taking the races away from this city, but they will consider the subject. If assured of financial support from Elgin business men, they will turn down the Chicago proposition. Rains last year proved disastrous to the financial success of the meet.

E. A. Introduces New Rear Signal

BROOKLYN, N. Y., Jan. 7—The E. A. Laboratories, this city, have just perfected a new electrically operated rear lamp signaling device and are making a bid for equipment business. It substitutes for the usual rear lamp with no additional cost.

The E. A. Laboratories, having outgrown their quarters at 627 Kent Avenue, Brooklyn, have just moved into their new building at Broadway and Wythe Avenue, where they expect to produce half a million automobile horns during 1916.

Three More Maxwell Branches

DETROIT, MICH., Jan. 10—The Maxwell Motor Sales Corp. has opened branches in Philadelphia, Atlanta and Providence, in charge respectively of L. G. Peed, C. H. Batchelor and O. C. Reed.

Indianapolis Race Changes

Drivers to Get 25% of Gate Receipts During Practice —33 Starters

INDIANAPOLIS, IND., Jan. 10—Entry blanks for the 300-mile sixth annual race on the 2½-mile brick speedway in this city have been issued, as reported in THE AUTOMOBILE for Jan. 6, and in addition to showing the race of 300 miles for $30,000 in prizes, several other changes as compared with previous Indianapolis races are noted. For the first time the speedway agrees to pay entrants 25 per cent of the gross gate receipts during practice, the distribution of this practice money to be based on the number of laps driven between the hours of 2 and 5 p. m. on practice days. The number of starters has been limited to thirty-three cars and the previous order of eliminating will be carried out so that only the fastest thirty-three cars of all entrants will start. The management insists on the use of steel or bronze spiders on the steering wheels, requires chain-driven cars to have chain guards, and leaves the safety of all other parts of the car, such as steering parts, front axle, etc., to the judgment of the speedway technical committee.

80 M.P.H. Required

The American Automobile Assn. rules will apply in all details including the entry of five cars of the same make. Instead of cars having to qualify at a speed of 75 m.p.h., the figure has been raised to 80.

Tacoma Speedway Race Aug. 5

TACOMA, WASH., Jan. 7—The Tacoma Speedway Assn. announces that the principal racing event of 1916 will be held on Aug. 5, and that the prize for the one race will be $10,000, with a distance of approximately 300 miles, with intermediate prizes for the 100 miles, and the 200 miles.

The big race of the year will be a combination of the Montamarathon and the Potlatch trophy races, and will be broadened into a race for the whole Northwest, and has not yet been named.

Lien Against Sheepshead Speedway—Will Not Affect Operation

NEW YORK CITY, Jan. 10—A lien has been brought against the Sheepshead Bay Speedway Corp., owner of the 2-mile motor speedway for $203,437. The speedway has for many months refused to pay this construction item on the ground that there has been an overcharge of approximately $100,000. The speedway had previously agreed to settle on this

basis, but as the contractor has refused, the matter has gone into the courts. The case will not come up for hearing inside of a year and will in no wise affect the speedway, the finances of which are in ample condition to take care of all indebtedness. To date the speedway has a total investment of $3,550,000 made up of property, real estate, $2,050,000, and track, grandstands, and other improvements $1,500,000. The real estate embraces 430 acres of land. Part of this land lies outside of the grounds and is being sold for building purposes.

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45 Car and Truck Exhibits at Cleveland Show

CLEVELAND, OHIO, Jan. 8—Although the doors of the Wigmore Coliseum were opened for visitors to the fifteenth annual Cleveland automobile show at 1 o'clock, the formal opening did not take place until 7.30 in the evening. Through the afternoon, however, there was a constant throng of people looking over the forty-five exhibits of automobiles and trucks. Three manufacturers are exhibiting electric cars. One of them showed two models; another, three, and the third showed four.

The number of chassis shown seems rather small, considering the fact that they are always given great attention.

Two local companies, the Peerless Motor Car Co., and the White company, made special displays of the trucks turned out at their plants. Peerless showed its 2-, 4- and 5-ton trucks, all 32.4 hp. White displayed a complete 45 hp. truck and chassis of a 45-hp. and three 30 hp. trucks. Several other light trucks and delivery wagons were shown, including the Baker electric 1- and 2-ton trucks.

Among other exhibits of the Gabriel Auto Co. was a bus built for the Green Line Bus Co. which operates a line between Cleveland and Strongsville and, when this new car is added, will extend the line to Medina. The bus is built to resemble a street car and is equipped with rattan seats with a capacity for seating twenty-one people. It is equipped with a 40 hp. engine and the tires are 36 by 6.

The White company has on exhibition a car with seating capacity for twenty persons. It is equipped with the usual White engine and the body is built something on the order of a sight-seeing car. However, the seats are placed crosswise, with an aisle down the center.

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Cars Reduce Kansas R. R. Earnings

TOPEKA, KAN., Jan. 7—Railroad officials state that a disastrous slump in local passenger business has been occasioned by the large number of automobiles in Kansas and as a consequence have asked for an increase from 2 cents a mile to 3 cents on passenger rates.

Milwaukee Show Opens

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56 Makers Represented—Show Caters to 4,000,000 People —Trucks Exhibited

MILWAUKEE, WIS., Jan. 8—The eighth annual show of the Milwaukee Automobile Dealers', Inc., opened last night, in the Milwaukee Auditorium and attracted the largest first-night crowd ever known here, or 4790. A total of fifty-six manufacturers are represented by exhibits.

As in past years, the entire basement of the Auditorium is devoted to exhibits of trucks, commercial cars, bodies, and heavy parts and supplies.

The Milwaukee show, like its predecessors, is principally a retail selling proposition, although it ranks high as a booster for the sales by State or district agents to sub-dealers from all parts of the State.

It is estimated that more than 1500 garage-keepers, repairshop owners and agents from every section of Wisconsin attend the January show. With this in view, various organizations select the January show week for the important conventions of the year, notably that of the Wisconsin Retail Automobile Dealers' Association. The M. A. D. annually entertains the visiting tradesmen at a monster banquet, which this year will be held Wednesday evening, Jan. 12, after show-closing time, 10:30 p. m. More than 700 acceptances have been booked.

The Milwaukee show is the principal one between Chicago and Minneapolis and caters to a total population estimated at 4,000,000 people.

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Cincinnati to Stop Reckless Driving

CINCINNATI, OHIO, Jan. 10—The city authorities and the judiciary of Cincinnati have both taken up the question of obediance to traffic rules and ordinances and the result is a more stringent observance of the laws which are now in force. Steps are also being taken to have enacted more rigorous laws for the control of traffic on the streets of the city.

Safety Director W. J. Friedlander, acting under instructions from Mayor Puchta, has issued orders to the police to place reckless drivers of automobiles and motor trucks under arrest and to force them to furnish bonds, instead of being cited to appear in court.

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Hercules Motor Completes Organization

CANTON, OHIO, Jan. 6—The Hercules Motor Mfg. Co., this city, recently organized to build automobile motors, has completed its organization by the election of Charles Balough, president; Gordon M. Mather, vice-president, and O. J. Strayer, secretary and treasurer. Mr. Strayer is at present secretary and treasurer of the Canton Stamping & Enameling Co. Others on the board of directors are H. H. Timken of the Timken Roller Bearing Co., J. G. Obermier and L. Pulcher.

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Reo Employees Get Christmas Present

LANSING, MICH., Jan 3—A $5 gold coin was given as a Christmas present to every employee, either in the shops or in the offices, of the Reo Motor Car Co., and of the Reo Motor Truck Co. All told, 4500 employees were in line, which means that the companies distributed $22,500 in gold.

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Star Rubber to Start Work

AKRON, OHIO, Jan. 7—The Star Rubber Co., which has been making automobile sundries, is to begin the manufacture of automobile tires. For this purpose a three-story building 70 by 100 ft. will be put up at a cost expected to be about $30,000.

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Dunham Body Factory Burns

NEWARK, N. J., Jan. 10—The plant and show rooms of the D. B. Dunham & Sons, Inc., manufacturer of automobile bodies, were destroyed yesterday by fire, entailing a loss of $100,000.

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Larrabee-Deyo Truck Makes Lease

BINGHAMTON, N. Y., Jan. 7—At a meeting of the directors of the Larrabee-Deyo Motor Truck Co., arrangements were perfected to lease part of the main building of the Sturtevant-Larrabee Co. for the manufacture of trucks.

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Goodyear Opens Station in Dakotas

ABERDEEN, S. D., Jan. 7—The Goodyear Tire & Rubber Co. has opened a service and sales station here to cover northern South Dakota and southern North Dakota. H. F. Brownell Co., Sioux Falls, state agent, will manage the new station here.

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Van Sicklen Speedometer on 1916 Stutz

NEW YORK CITY, Jan. 7—Announcement was made at the automobile show in this city that the Van Sicklen Co., Chicago, Ill., will equip all cars made by the Stutz Motor Car Co., Indianapolis, Ind., with its speedometers.

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Mitchell Eight $1,450

NEW YORK CITY, Jan. 7—In the Dec. 30 issue of THE AUTOMOBILE the price of the Mitchell eight was given at $1,250. The Mitchell company would like it announced that the price of this car is $1,450 f.o.b. Racine, for either three-passenger roadster or seven-passenger touring car.

Factory Miscellany

Cleveland-Ford Tire to Build—The Cleveland-Ford Tire Co., Ashtabula, Ohio, will soon start the erection of its plant.

Heinze to Add New Equipment—The John O. Heinze Co., Springfield, Ohio, contemplates installing additional equipment to its plant.

Ford Addition in Denver—The Ford Motor Co., Denver, Colo., will build a four-story addition to its assembling plant. The estimated cost is $150,000.

Harvey Top Starts Manufacturing—The Harvey Auto Top Co., 4050 Easton Avenue, St. Louis, Mo., has begun the manufacture of winter or convertible tops.

Link-Belt to Add—The Link-Belt Co., Indianapolis, Ind., will build an addition to its plant at Addison Street and the Vandalia Railroad, the estimated cost being $12,000.

Crow to Add—The Crow Motor Car Co., Elkhart, Ind., has awarded contracts for an addition to its plant which will be 60 by 240 ft., and will cost approximately $10,000.

To Make Tires in El Paso—J. Thomas Ward is organizing a company to build an automobile tire and tube manufacturing plant at El Paso, Tex., the estimated cost being $200,000.

Fuelton-Greuter to Move Plant—The Fuelton-Greuter Mfg. Co., Saugas, Mass., manufacturer of carbureters, will remove its plant to Cincinnati at an early date. A building at the corner of Sixth and Baymiller Streets has been leased.

Overland's Toledo Building Plans Changed—Plans for the Willys-Overland service building to be erected at Adams and Fourteenth Streets, Toledo, Ohio, have been changed in order to secure a larger structure. The new plans call for a fireproof structure, four stories high and 100 by 280 ft. The cost of the building will exceed $100,000.

Baldwin Locomotive Truck Plant—The Baldwin Locomotive Works, Philadelphia, is erecting a one-story factory building at its Eddystone property in which it will manufacture motor trucks exclusively. These trucks are for foreign service.

Mitchell-Lewis Improvements—The Mitchell-Lewis Motor Co., Racine, Wis., is installing an additional 300-hp. boiler and making other improvements to its power and generating facilities to accommodate the increased demand of its big plant. Immediately after Jan. 1 the force was increased and overtime schedules made effective in numerous departments to bring the production of cars up to the requirements of agents.

The Automobile Calendar

Jan. 7-13.....Milwaukee, Wis., Show, Auditorium.
Jan. 8-15.....Cleveland, Ohio, Show, Wigmore Coliseum, Cleveland Automobile Show Co.
Jan. 8-15.....Philadelphia, Pa., Show, Philadelphia Auto Trade Assn.
Jan. 13-18.....Columbus, Ohio, Show, Memorial Hall, Columbus Automobile Club and Columbus Auto Trades Assn.
Jan. 14-22.....Dayton, Ohio, Show, Delco Bldg., Dayton Automobile Dealers' Assn., and Dayton Accessory Dealers' Assn.
Jan. 10-15.....Fort Wayne, Ind., Show, Auto Trade Assn.
Jan. 10-15.....New Bedford, Mass., Show, State Armory.
Jan. 15-22.....Detroit, Mich., Show, Detroit Automobile Dealers' Assn.
Jan. 17-19.....Erie, Pa., Show, Erie Automobile Dealers' Assn.
Jan. 17-22.....Rochester, N. Y., Show, Exposition Park, C. A. Simmons, Mgr.
Jan. 17-22.....Wilmington, Del., Show, Wilmington Automobile Show Assn.
Jan. 18-21.....Fargo, N. D., Show, North Dakota and Minnesota Automobile Dealers' Assn.
Jan. 18-22.....Baltimore, Md., Show, Fifth Regiment Armory.
Jan. 25-29.....Lancaster, Pa., Show, Conestoga Park Pavilion.
Jan. 22-29.....Montreal, Que., Show, Almy's Bldg., Automobile Trade Assn., Ltd.
Jan. 22-29.....Chicago, Ill., Show, National Automobile Chamber of Commerce; Coliseum and First Regiment Armory.
Jan. 24-29.....Buffalo, N. Y., Show, Buffalo Automobile Dealers' Assn., Broadway Auditorium.
Jan. 24-29.....Scranton, Pa., Passenger Car Show, Town Hall.
Jan. 24-30.....Portland, Ore., Show, Armory, Portland Automobile Dealers' Trade Assn.
Jan. 25, 26, 27....Montgomery, Ala., Show, Klein Bldg., Montgomery Automobile and Accessories Dealers.
Jan. 29-Feb. 5....Columbus, Ohio, Show, Memorial Hall, Columbus Automobile Show Co.
Jan. 29-Feb. 5....Minneapolis, Minn., Show, National Guard Armory, Minneapolis Trade Assn.
Jan. 31.....Scranton, Pa., Show, Commercial Car Show, Town Hall. H. B. Andrews, Mgr.
Jan. 31-Feb. 5....Fall River, Mass., Show, State Armory. R. C. Borden, Mgr.
Feb. 1-3.....Frederick, Md., Show, Armory.
Feb. 1-5.....York, Pa., Show, York Auto Dealers' Assn.
Feb. 2-5.....Buffalo, N. Y., Show, Auditorium, Buffalo Automobile Mfrs. and Dealers' Assn.
Feb. 2-5.....Poughkeepsie, N. Y., Show, State Armory.
Feb. 7-12.....Kansas City, Mo., Show, J. I. Case, T. M. Bldg., Kansas City Motor Dealers' Assn.
Feb. 7-12.....Duluth, Minn., Show, Armory, Duluth Automobile Dealers' Assn.
Feb. 8-11.....Grand Forks, N. D., Show, Auditorium.
Feb. 9-12.....Peoria, Ill., Show, Coliseum, Peoria Automobile and Accessory Assn.
Feb. 12-19.....Albany, N. Y., Show.
Feb. 12-19.....Hartford, Conn., Show, First Regiment Armory, Hartford Automobile Dealers' Assn.
Feb. 14-19.....Des Moines, Ia., Show, Des Moines Auto. Dealers' Assn.
Feb. 14-19.....Winnipeg, Man., Show, Ford Plant, Winnipeg Motor Trades Assn.
Feb. 19.....Newark, N. J., Show, First Regiment Armory, C. G. Fitzgerald, Mgr.
Feb. 20-27.....Grand Rapids, Mich., Show, Klingman Furniture Exhibition Bldg., Automobile Business Assn.
Feb. 21-26.....Bridgeport, Conn., Show, State Armory. B. B. Steibler, Mgr.
Feb. 21-26.....Louisville, Ky., Show, First Regiment Armory.
Feb. 21-26.....Omaha, Neb., Show, Omaha Automobile Show Assn.
Feb. 21-26.....Portland, Me., Show, Exposition Bldg.
Feb. 21-26.....South Bethlehem, Pa., Show, Coliseum. J. S. Elliot, Mgr.
Feb. 21-26.....Syracuse, N. Y., Show, Syracuse Automobile Dealers.
Feb. 28-Mar. 3....Pittsburgh, Pa., Convention of American Road Builders' Assn., Mechanical Hall.
Feb. 28-March 4..Paterson, N. J., Fifth Annual Show, Auditorium.
Feb. 29-Mar. 4....Ft. Dodge, Ia., Show, Terminal Bldg., Ft. Dodge Automobile Dealers' Assn.
March 4-11.....Boston, Mass., Car and Truck Show, Mechanics Bldg.
March 8-11.....Davenport, Ia., Show, Tri-City Davenport, Rock Island & Moline; Tri-City Automobile Trade Assn.
Mar. 8-11.....Mason City, Ia., Show, Armory.
March 8-15.....Brooklyn, N. Y., Show, Brooklyn Motor Dealers' Assn.
Mar. 21-25.....Deadwood, S. D., Show, Auditorium, Deadwood Business Club.
Mar. 28-Apr. 3....Manchester, N. H., Show, Under Auspices Couture Bros. Academy.
May 13.....New York City, Vanderbilt Cup, Sheepshead Bay Speedway Race.
May 20.....Chicago, Ill., Amateur Drivers' Race, Chicago Motor Speedway.
May 30.....Indianapolis Track Race.
June 17.....Chicago Track Race.
June 28.....Des Moines, Ia., Track Race.
July 4.....Minneapolis Track Race.
July 4.....Sioux City Track Race.
July 15.....Omaha, Neb., Track Race.
Aug. 5.....Tacoma Track Race.
Aug. 18-19.....Elgin Road Race.
Sept. 4.....Des Moines Track Meet.
Sept. 15.....Indianapolis Track Race.
Sept. 16.....Providence Track Race.
Sept. 30.....New York City Sheepshead Bay Race.
Oct. 7.....Omaha Track Race.
Oct. 14.....Chicago Track Race.

The Week in the Industry

Pardee Is Diamond-T Sales Manager—Fred Pardee has been made sales manager of the Diamond-T Motor Car Co., Chicago, Ill.

Stanford Is Westcott Purchasing Manager—E. E. Stanford of Indianapolis has been made purchasing manager of the Westcott Motor Car Co., in Richmond, Ind.

Rittenhouse Joins Norwalk Tire—L. K. Rittenhouse, former manager of the St. Louis branch of the B. F. Goodrich Co., has become associated with the Norwalk Tire & Rubber Co., Norwalk, Conn. O. E. Hoerger, former assistant branch manager of the St. Louis Goodrich office, is now acting manager.

Dealer

Overland Factory Office in Seattle—The Willys-Overland Co. will establish a factory office in Seattle, Wash., controlling the territory of Washington, Oregon, Idaho, Montana and British Columbia. Offices will be opened at the plant of J. W. Leavitt & Co., which remains the distributer of the Overland. This company will augment its office staff by moving there W. J. Pedlar, at one time its San Francisco manager, who will be supervisor in the Northwest at Seattle.

Philadelphia Trade News—J. R. McClellan, manufacturer and sales agent of the McClellan tire, will retail that tire, together with the Chester tire and Efficiency gas oil, at 817 North Broad Street.

The George W. Reinbold Co. is erecting showrooms and service station at 2506 North Broad Street, the home of the Scripps-Booth car.

The Metz Co. has opened new showrooms at the southwest corner of Broad and Wood Streets.

Overland Makes N. Y. Lease—The Willys-Overland Co. has leased the Conrad Stein Brewery property, running through the block from Fifty-seventh to Fifty-eight Streets, near Eleventh Avenue, New York City. A new concrete, eight-story building, which is to be 150 ft. wide by 200 ft. deep, will be fitted out as zone offices and general headquarters for the New York zone. The entire upper part of the building will be occupied by the wholesale establishment while the lower part will be sublet to the C. T. Silver Motor Co., the New York City distributor, as a service station for its customers.

Motor Men in New Roles

Drawe Resigns from Pathfinder—G. E. Drawe has resigned from the Pathfinder Co., Indianapolis, Ind., and is now assistant general manager of the Allen Motor Co., Fostoria, Ohio.

Kimball Makes Change—Wade Kimball, formerly sales manager of the Moreland Motor Truck Co., has assumed the duties of manager of the Pacific Metal Products Co.'s truck and tractor department, Los Angeles, Cal.

Montgomery Joins Standard Truck—G. M. Montgomery, formerly traveling representative for the Bessemer Motor Truck Co., has been appointed eastern traveling representative for the Standard Motor Truck Co., Detroit, Mich.

Flint Heads Los Angeles White—G. M. Flint has been placed at the head of the pleasure car department of the Pioneer Commercial Auto Co., Los Angeles, Cal., which controls the southern California and Arizona agency for the White products. Mr. Flint for the past two years has been manager of the local Moline branch.

Spencer Moline Mgr.—L. R. Spencer has been appointed sales manager of the Los Angeles Moline Automobile Co., factory branch. For the past two years Mr. Spencer has been in charge of the service for the company in this territory and previous to his coming to Los Angeles was connected with the sales department at the factory.

Gallmeyer Transferred to Fort Wayne—E. G. Gallmeyer, district manager for the S. F. Bowser Oil Tank & Pump Co., Fort Wayne, Ind., has been transferred from Louisville, Ky., where he was manager of the Louisville branch, to Fort Wayne, where he will act as editor of the Bowser Boomer, the monthly publication of the company. A. D. Carriger will succeed him at the Louisville branch. G. A. Townsend, Jr., advertising and publicity manager for the Bowser company has acted as editor of the Boomer but on account of the increase in business he would be unable to look after getting out the publication. The fourth annual convention of the Bowser Pacemakers has been in session at the home office during the past week. One hundred and seventeen salesmen this year are members of the club.

Chouteau Made V.-P.—August Chouteau has been made vice-president of the Bittel-Leftwich Tire Service Co., St. Louis, Mo., and will take an active interest in the business.

Wilkinson Blair Mgr.—R. L. Wilkinson has been appointed general manager of the factory of the Blair Motor Co., Newark, Ohio. R. C. Hammond has been elected secretary-treasurer of the company.

Metcalf Joins Philadelphia Houk—W. H. Metcalf, heretofore associated with the management of the Bartlett garages, and secretary of the Philadelphia Motor Truck Assn. since its organization, will in future have charge of the Houk wire wheel interests in Philadelphia, with headquarters at 328 North Broad Street.

Dealer

New Detroit Body Co.—The Beach-Cross Body Co., Detroit, Mich., has opened for business at 863 Woodward Avenue, handling the product of the Highland Body Mfg. Co., Cincinnati.

New Detroit Firestone Home—The new home for the Detroit branch of the Firestone Tire & Rubber Co., will be a four-story structure, 181 by 300 ft. at Woodward and Canfield Avenues. It will be started at once and is expected to cost between $30,000 and $50,000.

L. I. Site for Pierce-Arrow—The Arrow Motor Realty Co., representing the interests connected with the Harrolds Motor Car Co., agent for the Pierce-Arrow automobile, New York City, has purchased an entire block in Lond Island City, directly at the rear of its service building erected last year, involving the property bounded by Freeman and Webster Avenues, Fifth and Sixth Streets.

Omaha Goodyear Again Adds—For the third time since occupying its new quarters last spring, the Omaha, Neb., branch of the Goodyear Tire & Rubber Co., has been forced by the development of trade to add to its floor space in very material degree. The last move will increase the space by about 3500 ft.

When the branch first moved in, it had about 5000 ft. of floorspace. It now has 14,000, and the latest move, besides including extensive remodeling within the building already occupied, involves also the occupying of the basement of an adjoining building. After the first of the year, the branch will have a district credit office and a district mechanical office, with special men to handle these new goods. The sales force will have been increased to twelve men.